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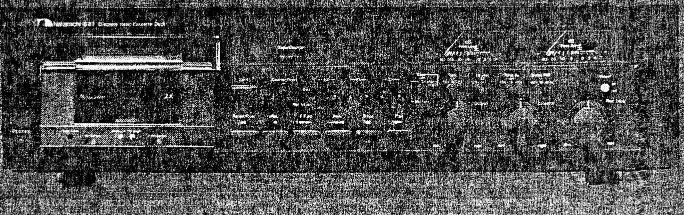
Nakamichi

Service Manual

Nakamichi 581

Discrete Head Cassette Deck


Nakamichi 581 Discrete Head Cassette Deck

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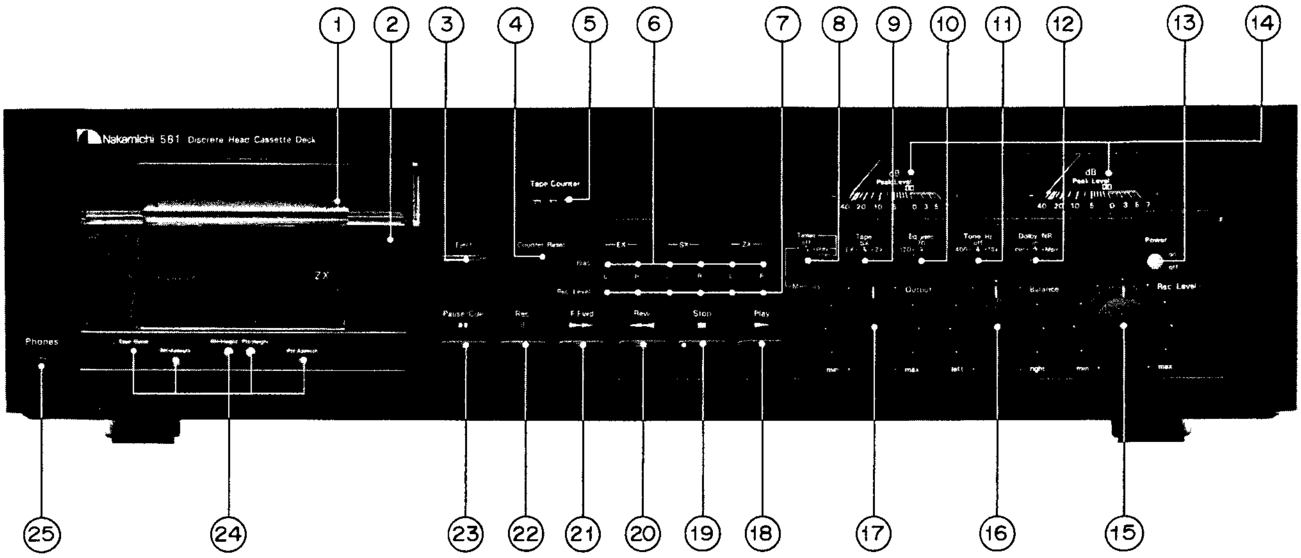
1. GENERAL

1.1. Control Functions

Nakamichi 581 control functions are shown below:

1. Acrylic Cassette Compartment Cover
2. Cassette Lid
3. Eject Button
4. Counter Reset Button
5. Tape Counter
6. Bias Adjustment Controls
7. Record Calibration Controls
8. Tape Start Memory/Timer Switch
9. Tape Switch (EX/SX/ZX)
10. Eq. Switch (120 μs/70 μs)
11. Test Tone Switch (400 Hz/15 kHz)
12. Dolby NR/MPX Filter Switch
13. Power Switch
14. Peak Level Meters
15. Input Level Control (Record Level)
16. Balance Control
17. Output Level Control
18. Play Button
19. Stop Button
20. Rewind Button

21. Fast-Forward Button
22. Record Button
23. Pause/Cue Button
24. Head Height and Azimuth Alignment Screws
25. Headphone Jack
26. Input Jacks
27. DIN In/Out Connector
28. Output Jacks
29. DC Output Jack
30. Remote Control Socket
31. Voltage Selector
32. Power Cord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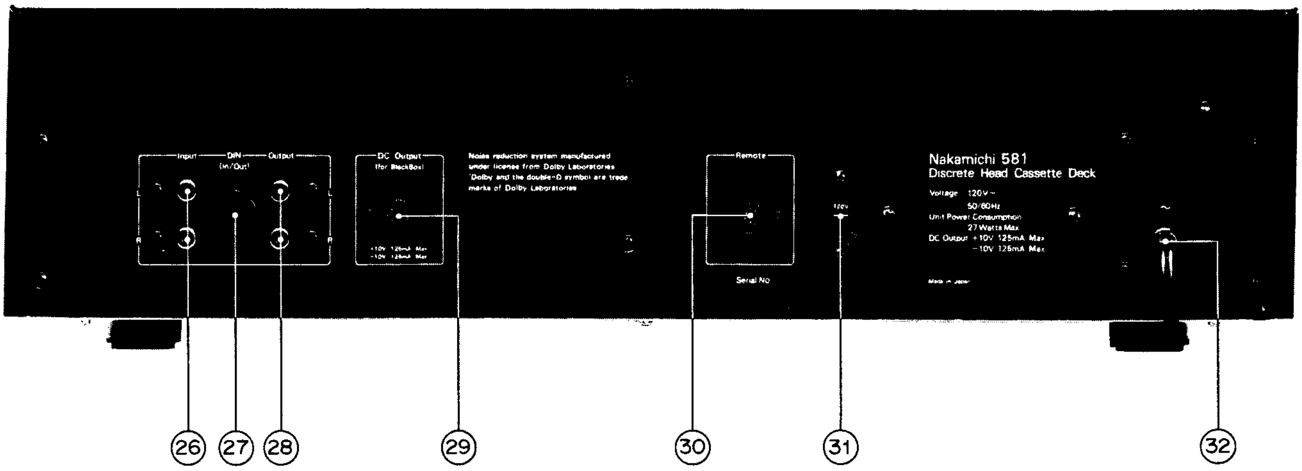
Nakamichi 581 Discrete Head Cassette Deck
ZX
Tape Counter
Counter Reset
EX
SX
ZX
Bias
Rec Level
Pause/Cue
Rec
F Fwd
Rew
Stop
Play
Phones
dB
Peak Level
Tape
EQ
Tone Hz
Dolby NR
Power
on
off
Output
Balance
Rec Level
min
max
left
right

Fig. 1.1 Front View


Input
DIN (In/Out)
Output
L
R
DC Output (for BlackBox)
+10V 125mA Max
−10V 125mA Max
Noise reduction system manufactured under license from Dolby Laboratories
'Dolby' and the double-D symbol are trade marks of Dolby Laboratories
Remote
Serial No
120V
Nakamichi 581
Discrete Head Cassette Deck
Voltage 120V~
50/60Hz
Unit Power Consumption
27 Watts Max
DC Output +10V 125mA Max
−10V 125mA Max
Made in Japan
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㉗
㉘
㉙
㉚
㉛
㉜

Fig. 1.2 Rear View

1.2. Voltage Selector

Voltage selector is installed on the rear panel for other versions of the Nakamichi 581. This voltage selector can select either 120 V or 220 – 240 V at customer's disposal.

2. PRINCIPLE OF OPERATION

2.1. Mechanisms

2.1.1. 3-Head Configuration

N-581 is a Discrete Head Cassette Deck which contains a Playback Head, Record Head and Erase Head within a double-capstan closed-loop. Since it contains three heads, with narrow gap for Playback Head and wide gap for Record Head, N-581 has excellent playback and recording characteristics. Three Heads, because they are installed in the double-capstan closed-loop, can result adequate tape tension and stable tape drive.

Accuracy of tape travel is one of the most essential factors for a device to optimize its performance. Inaccurate tape travel will therefore induce deterioration exemplified by the following:

(a) vibration will be given to tape travel, as a result of which flutter and modulation noise will become increased

(b) insufficient tape-to-head contact will result in level drops

(c) tape skew will become greater and frequency response will become decreased

Needless to say, constant tape travel must consist of smooth drive mechanism, as well as of the fact that tape, heads and tape guide are placed in the most appropriate positions.

(1) Playback Head

Even if an azimuth misalignment is noted because of tape skew, deterioration of performance has been greatly reduced upon decreasing the gap of the Playback Head to narrow. The gap of this Playback Head is 0.9 micron. Where gap width is decided to be d, it is publicly known that the gap loss Ld is obtained by the following formula:

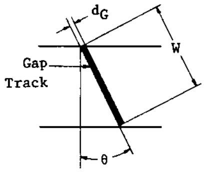
$$Ld = 20 \log \frac{\sin \frac{\pi d}{\lambda}}{\frac{\pi d}{\lambda}} \text{ (dB)}$$

Legend: d = Gap width of Playback Head
λ = Recording wave length
(λ=v/f, v=Tape speed)

The Playback Head employed a narrower gap, and is of crystal permalloy (same as SuperHead which is used in N-600II and N-580). The narrower gap head resulted in decreasing loss against frequencies at highs and an improvement of frequency response.

Where there should be any azimuth misalignment, it would equivalently be converted to gap loss and will give affect to frequency response.

Fig. 2.1.1 shows equivalent gap width, Fig. 2.1.2 azimuth misalignment at frequency of 20 kHz vs azimuth loss (playback output loss) when gap width is considered to be a parameter, and Fig. 2.1.3 shows frequency vs azimuth loss when azimuth misalignment is considered to be a parameter.



$$\text{Loss} = 20 \log \frac{\sin \frac{\pi d}{\lambda}}{\frac{\pi d}{\lambda}} \text{ (dB)}$$

$\lambda = v/f = \text{Tape Speed}/20\text{ kHz} = 2.375\ \mu m$

$d \fallingdotseq d_G + W \sin\theta$

d_G: Gap Width = 0.9/1.5 μm

W : Track Width = 600 μm

Fig. 2.1.1 Equivalent Gap Width

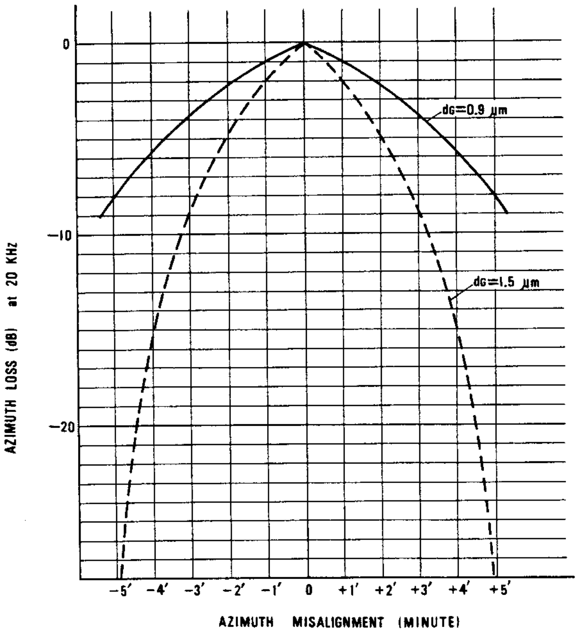


Fig. 2.1.2 Azimuth Misalignment vs Azimuth Loss (Playback Output Loss) at 20 kHz

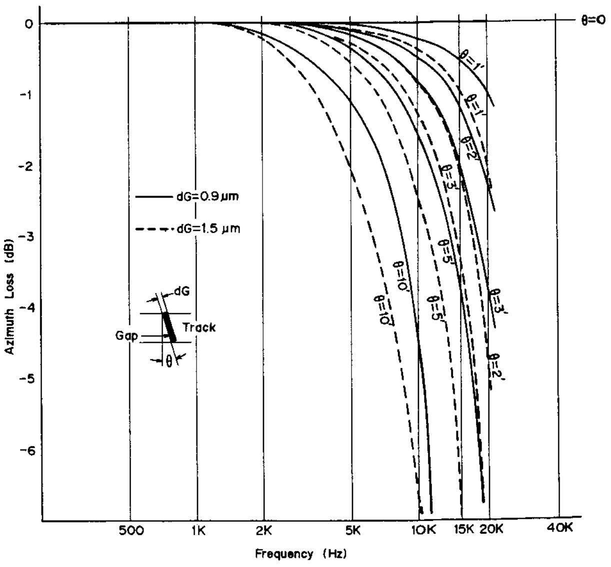


Fig. 2.1.3 Frequency vs Azimuth Loss

(2) Record Head

N-581 Record Head is of crystal permalloy, same material as Playback Head's, but with the gap of 3 microns.

In order to reduce the distance between Playback Head and Record Head, the latter is made very small. Further it is designed to bring the gap out of center. Also, the surface of the latter is made not symmetrical in shape. All these bring about excellent effect in tape travel and recording characteristic.

(3) Erase Head

Fig. 2.1.4 shows the sectional view of Erase Head.

Fig. 2.1.5 shows the characteristics of erasing current and erasure.

It has the same characteristics with N-580's Direct-Flux Erase Head but been purposely developed to minimize the size further.

Conventional Erase Head had its inside core narrower than its outside core, while this Erase Head is equipped with an inside core wider than the outside core. This has resulted more power sufficient enough for erasing even Metal Tape with small power consumption, approx. 0.5 W, though the head width is as small as 3 mm. The smaller the power consumption is, the smaller will be the heat generation, and this is of course another merit.

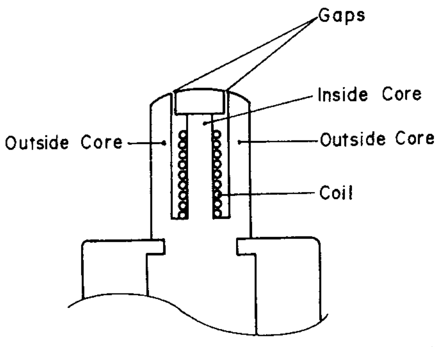


Fig. 2.1.4 Sectional View of Erase Head

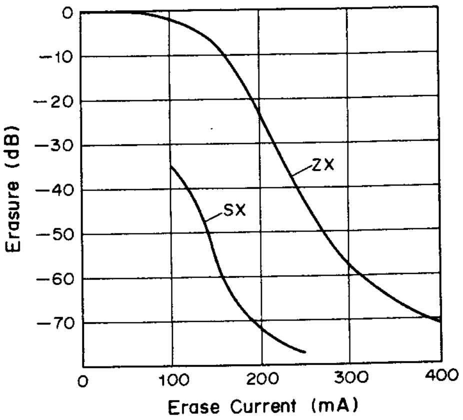


Fig. 2.1.5 Characteristics of Erasing Current and Erasure

(4) Headblock

Refer to Fig. 2.1.6.

N-581 Playback Head and Record Head, they are both made small in size so that the both heads are assembled in a space of the conventional Record/Playback Head. Erase Head is located at the place where the Record Head is located in the N-700II/1000II.

Both Playback Head and Record Head are assembled on the Head Mount Base. Take-up Tape Guide and Supply Tape Guide are fixed to the Take-up Pressure Roller Arm and Supply Pressure Roller Arm, respectively. Erase Head is placed on the Head Base. All these can be separately adjusted.

Record Head is placed slightly backward, approximately 0.15 mm away from the Playback Head. Record Head is placed approximately 3° inclined leftward. Shape of the Heads and its location have been carefully studied to bring about smoother contact of tape with the Heads. Pad Lifter is affixed to the Playback Head so as not to let Tape Pad touch the Head to give more stabilized tape travel, making it free from the influence of the Tape Pad within the Cassette Tape. Thus the trouble of changes in azimuth can now be avoided at changing of cassette tape, if only the Record Head azimuth is properly adjusted in advance.

The Fig. 2.1.7 shows trackings of each head against a tape of the N-581, wherein the figure shows ideal locations at the time of designing, thus the tracking in actual use will vary more or less, depending upon the tape width, etc.

(a) Adjustment of Tape Guide Height

Tape Guide of the N-581 is assembled into the Take-up and Supply Pressure Roller Assemblies. With a spring in the stud of Mechanism Chassis Ass'y, Pressure Roller Ass'y is tightly affixed with Tape Guide Adjustment Nut. The Adjustment Nut is placed on a spring through Pressure Roller Arm, and therefore by either tightening or loosening adjustment the height of the Tape Guide will become possible.

(b) Playback Head Height Adjustment and Azimuth Alignment

Azimuth and height of Playback Head can be made independently and adjustment may be done separately without affecting others. In order to adjust the tilt of Playback Head backwards or frontwards, take off the Height Gear Stopper and take out the Height Gear and then turn the two Height Adjustment Screws. After the adjustment is done, place the Height Gear back and fix it with the Height Gear Stopper. After the tilt is adjusted in such a way as above, adjust the height by loosening or tightening the Height Gear. Azimuth alignment is adjusted by loosening or tightening the PH Azimuth Screw. This system has been carefully designed so as to minimize influence each other between azimuth and height adjustment.

(c) Record Head Height Adjustment and Azimuth Alignment

Record Head tilt adjustment can be performed in the same way as for the Playback Head.

Height adjustment can be adjusted while recording 400 Hz test tone by loosening or tightening RH Height Adjustment Screw to obtain the maximum level on the both Level Meters. Azimuth alignment can be adjusted while playing back 15 kHz test tone by loosening or tightening RH Azimuth Alignment Screw to obtain the maximum level on the both Level Meters.

This system has also been carefully designed so as to minimize influence each other between azimuth and height adjustment.

(d) Erase Head Height and Tilt Adjustment

Erase Head is affixed onto the Erase Head Plate which is assembled with the Head Base. It is installed with three screws. By turning these screws, its height, tilt of backward or frontward, and tilt of leftward or rightward can be adjusted separately, thus the best location of Erase Head can be obtained.

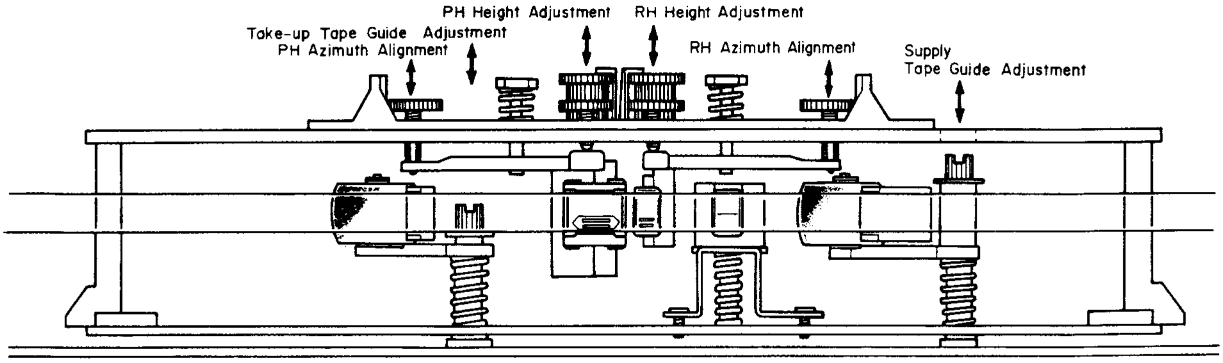

PH Height Adjustment
RH Height Adjustment
Take-up Tape Guide Adjustment
PH Azimuth Alignment
RH Azimuth Alignment
Supply
Tape Guide Adjustment

Fig. 2.1.6 Headblock

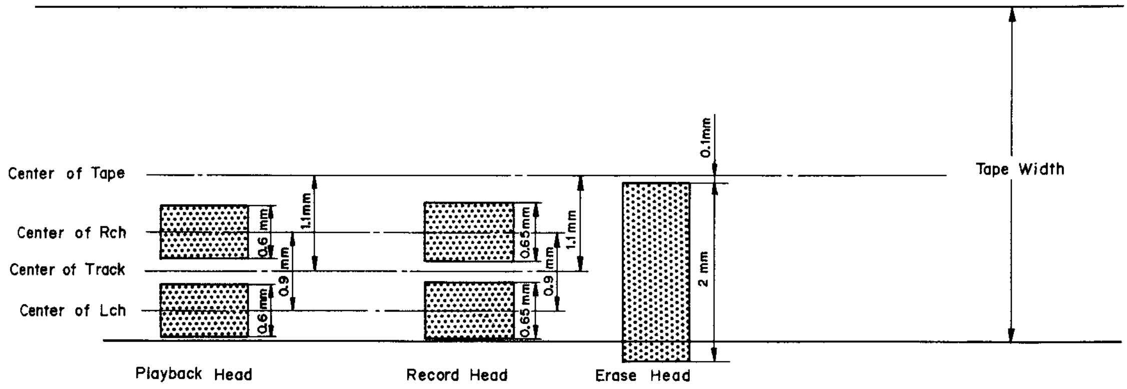

Center of Tape
Center of Rch
Center of Track
Center of Lch
0.6mm
0.6mm
0.9mm
1.1mm
0.65mm
0.65mm
0.9mm
1.1mm
0.1mm
2 mm
Tape Width
Playback Head
Record Head
Erase Head

Fig. 2.1.7 Trackings

2.1.2. Double Capstan Tape Drive

As shown in Fig. 2.1.8, the double capstan system consists of two capstan shafts (a) and (b) connected to the two flywheels which are driven by a capstan belt.

Against these capstans two pressure rollers (a) and (b) are engaged to run the tape with an adequate holdback tension created by the double capstan and pressure rollers.

Since the diameter of capstan shaft (a) is smaller than that of capstan shaft (b), when two flywheels begin to turn as shown in the figure, capstan (a) runs slightly faster than capstan (b), which subsequently generates holdback tension.

As you note, if the diameters of the 2 capstans should be the same, the generation cycles of wow and flutter will become approximately the same, as a result of which defective portion will be doubly superposed and preferable portion vice versa. The N-581 employs 2 capstans, each having different diameter and rotations, thereby avoiding the aforesaid occurrence and stabilizing wow and flutter characteristics.

As the double capstan system always creates a constant and stable holdback tension between the two capstans, the condition of the tape between two capstans will not be affected by any external conditions such as irregular take-up and supply torques, irregular loading of cassette tape, undesirable mechanism vibration and etc., thus assuring the superior wow and flutter characteristics. The double capstan system provides a constant holdback tension on the tape and maintains the stable pressure onto the tape against the heads.

The only critical factor in the double capstan system is to be considered; the two capstans have to be positioned perfectly in parallel and to be precisely vertical against the head base, the pressure rollers have to be evenly pressed against the capstan shafts and the head surface must be positioned perfectly vertical to the tape surface. Otherwise, the running tape might become out of the tape guide resulting in irregular movement.

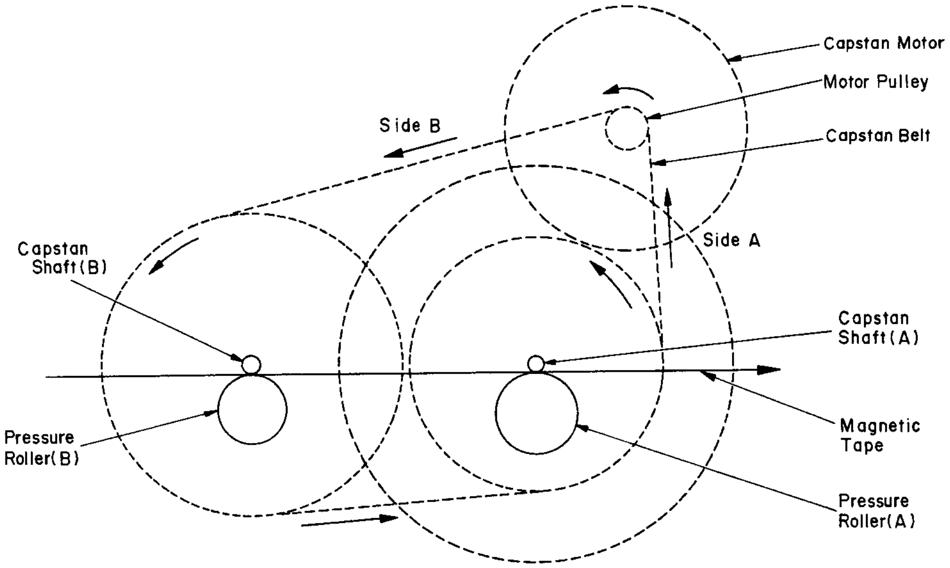


Fig. 2.1.8 Double Capstan Tape Drive

2.1.3. Mechanism Control Cam Operation

Refer to Fig. 2.1.9 Mechanism Control Cam timing chart. Function of N-581 Mechanism is done by Cam Control. Cam is driven by the Control Motor. The Motor operates so as to result zero in the difference of voltages between each voltage corresponding to mechanism function and each reference voltage which corresponds to each commands of the Control Switch. When the difference comes to zero, then it stops. In this way, each function is kept properly operated. For further details, please see the explanation on Logic Control. Here we explain principle of its mechanical functions.

Cam Control System works as follows: Cam Drive Gear is driven by Control Motor by means of Drive Belt. Cam Drive Gear is related to the cam with which each function may be mechanically set on.

(1) Play Mode

Press the Play Switch to make it Play mode. Then the Cam begins to move from Stop position to Play position and the Play mode will be set.

The Head Base which is linked to the Cam and which is normally pushed against the Stop position gets released and the Head Base will slowly come out for playing. To explain this function, first the Head Base is latched and the Reel Motor begins to turn. Then the Pressure Roller will be pushed and the Brake will be released. Now the tape begins to run. If you press the Pause Switch at this stage, it comes to Pause mode. Brake operates and the Pressure Roller moves away from the Capstan and the Reel Motor stops.

Play mode may be changed to Stop mode by pressing the Stop Switch, and latch of the Head Base being released. The Cassette Case cannot be opened because of the latched eject effect unless it is in Stop mode.

(2) Record Mode

By pressing the Record Switch and the Pause or Play Switch, it may be made to Record mode. The Cam at this moment moves from Stop position to Rec. position. At the same time, Rec. Trigger Mechanism is driven and the Record Switch on the Main P.C.B. is switched on to the Record side. Further, the Cam turns until it comes to the Pause or Play position. On the other hand, the Rec. Trigger Mechanism is released during this process. When the Cam is set in Rec./Pause or Rec./Play position, Record signals will be sent to Bias Oscillating Circuit from Logic Control Circuit to let the Bias to oscillate.

Press the Stop Switch and the Cam comes back to the Stop position. At the same time, it will set the Record Switch on the Main P.C.B. to the Play side.

(3) F.F. or Rewind Mode

By pressing F.F. or Rewind Switch, it comes either to F.F. or Rewind mode. The only difference of these two modes is that one is to turn the Reel Motor reverse and the other to transmit the torque against the Reel Hub onto the take-up side or to the supply side. Brake is released at this stage and the Reel Motor begins to turn F.F. or Rewind.

(4) Pause Mode

Press the Pause Switch to make it to Pause mode. In changing it from Stop mode to Pause mode, the Brake is first released, then the Head Base is latched, and again the Brake works.

At this stage, the Reel Motor would not turn with the Pressure Roller being apart from the Capstan, and the tape would remain still.

(5) Cue Mode

Cue mode may be either of Forward Cue or of Reverse Cue mode.

In either case, it could be effected by pressing F.F. Switch or Rewind Switch after the Pause Switch has been pressed. The speed of the tape at this moment will be 1/3 the running speed of normal F.F. or normal Rewind. The tape speed will get slow further down to 1/5 the speed of F.F. or of Rewind if you keep on pressing the F.F. or Rewind Switch. In this case, the Brake is released at first and then the Head Base will get latched at the Cue position and the Reel Motor will start while the Pressure Roller remains apart from the Capstan.

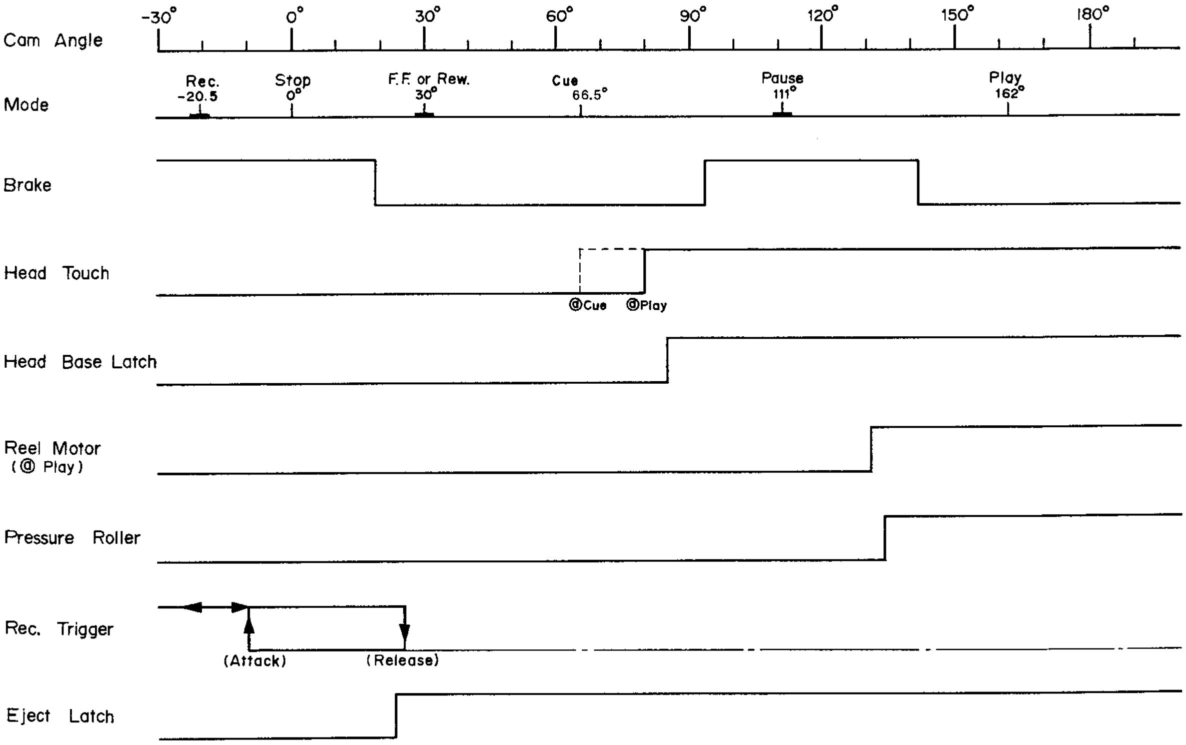


Fig. 2.1.9 Mechanism Control Cam Timing Chart

2.2. Amp. Circuits

2.2.1. Playback Eq. Amp. Circuit

Fig. 2.2.1 shows playback equalizer amp. circuit.

Fig. 2.2.2 shows its system diagram, and Fig. 2.2.3 shows time constant of equalizer.

Playback Head is connected to the input of this circuit. Amplifier, which is composed of Q105, 106 and 107, is an equalizer amplifier and its time constant is shown in Fig. 2.2.3. R146, R147, L105 and C139, which consist of peaking circuit, compensate Playback Head gap loss and improve frequency response at high. L105 and C138 compose bias trap circuit and prevent bias leakage from playback eq. amp. circuit. L105 is of variable type and adjustment performed by L105 is mainly for the purpose of reducing bias leakage.

Playback eq. amp. gain adjustment should be performed so as to obtain 100 mV at TP101 (TP201) by adjusting VR102 (VR202) during the course of playing back 400 Hz Level Tape (DA09005A). Eq. Switch (70 μs/120 μs) is connected to playback eq. amp. circuit and the overall time constant of playback eq. amp. circuit will become as follows:

Eq. Switch – 70 μs: 3180 μs (50 Hz) + 70 μs (2274 Hz)

Eq. Switch – 120 μs: 3180 μs (50 Hz) + 120 μs (1326 Hz)

Following table shows tapes used at each Tape Switch combined with Eq. Switch.

Tape SW	Eq. SW	Tape
ZX	70 μs	Nakamichi ZX
SX	70 μs	Nakamichi SX, TDK SA, Maxell XL-II Scotch Master 70 μs
EX	120 μs	Low-Noise High-Density (including EX, EXII, TDK AD, Maxell XL-I, Scotch Master 120 μs)
	70 μs	Nakamichi EX, EXII

It is specified in IEC Standard that time constant is 120 μs on tapes of ferric oxide, and 70 μs on tapes of Cr02.

However, in the case of Eq. Switch on N-581, when time constant at playback is changed, at the same time time constant at record must also be changed. Therefore, even though record and playback is made by the method other than the IEC Standard, no deterioration of frequency response or level difference will occur. (Any other method for instance, record and playback on ferric oxide tape with putting Tape Switch on EX and Eq. Switch on at 70 μs.) When Nakamichi EX or EXII Tape is used at Tape Switch: EX, and Eq. Switch: 70 μs, S/N ratio will be improved by approximately 4 dB (WTD).

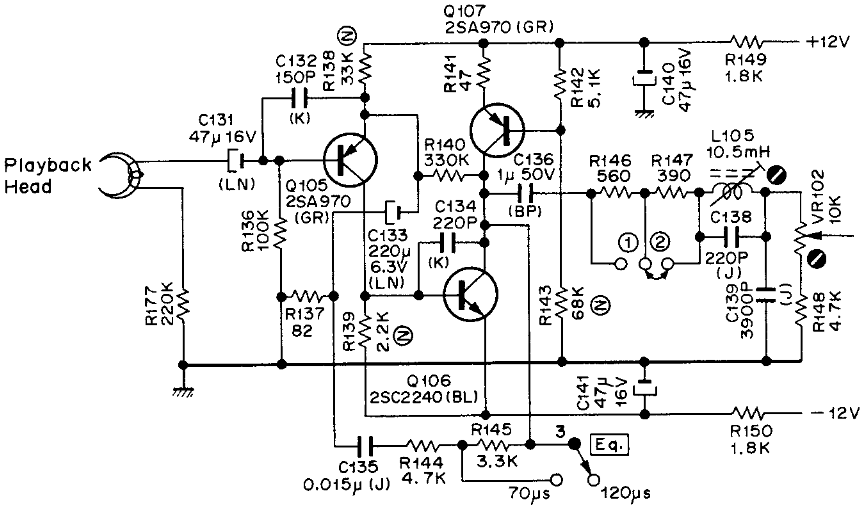

Q107
2SA970 (GR)
+12V
R149
1.8K
C132
150P
(K)
R138
33K
R141
47
R142
5.1K
C140
47μ 16V
C131
47μ 16V
(LN)
Playback
Head
Q105
2SA970
(GR)
R140
330K
C136
1μ 50V
(BP)
R146
560
R147
390
L105
10.5mH
VR102
10K
C134
220P
C133
220μ
6.3V
(LN)
(K)
C138
220P
(J)
R136
100K
R177
220K
R137
82
R139
2.2K
R143
68K
C139
3900P
(J)
R148
4.7K
Q106
2SC2240 (BL)
C141
47μ
16V
-12V
R150
1.8K
R145
3.3K
3
Eq.
C135
0.015μ (J)
R144
4.7K
70μs
120μs

Fig. 2.2.1 Playback Eq. Amp. Circuit

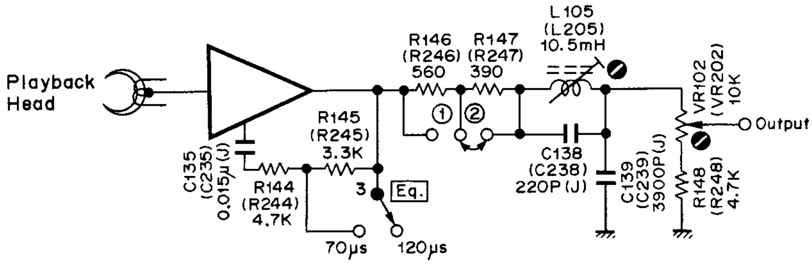

Playback
Head
R146
(R246)
560
R147
(R247)
390
L105
(L205)
10.5mH
VR102
(VR202)
10K
Output
R145
(R245)
3.3K
C138
(C238)
220P (J)
C139
(C239)
3900P (J)
R148
(R248)
4.7K
C135
(C235)
0.015μ (J)
R144
(R244)
4.7K
3
Eq.
70μs
120μs

Fig. 2.2.2 System Diagram

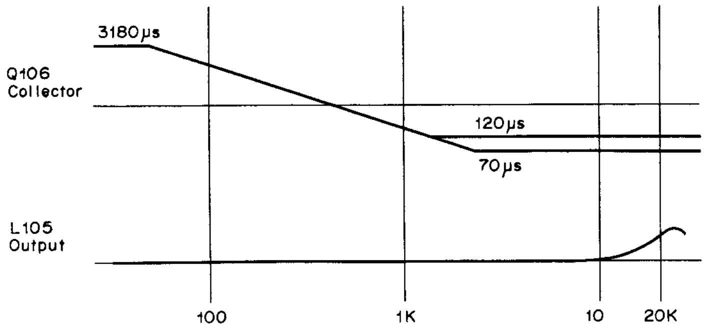


Fig. 2.2.3 Time Constant

2.2.2. Record Amplifier Circuit

Fig. 2.2.4 shows record amplifier circuit which employs a low noise operational amplifier IC.

This circuit adopted the direct coupling system (the DC amp. output is connected directly with the Record Head). Direct coupling system provides improvements of linearity and phase characteristic at low frequency, less distortion (as a clipping level becomes higher), etc.

This record amp. is muted with record signal from Logic P.C.B. Ass'y and also with mute signal.

With the exception of record mode, input and output of record amp. is muted simultaneously. At record mode, when mute signal is given from Logic P.C.B. Ass'y, input of record amp. will be muted.

2.2.3. Bias Oscillation Circuit

Fig. 2.2.5 shows a push-pull oscillator with an oscillation frequency of 105 kHz which is constructed by capacitors C316 and C317, coupling the collectors and bases of two transistors (Q301 and Q302).

This is used to provide recording bias and as an erase signal.

By pressing the Record and Pause, or Record and Play Buttons, $\overline{\text{Rec.}}$ signal conducted from the Logic P.C.B. Ass'y becomes L, and Q303 turns to ON.

Therefore, +12 V is applied to the circuit through Q303, as a result of which oscillation begins.

When the record mode is released, oscillator output is damped by the discharge of C315. This prevents magnetization of the Record Head.

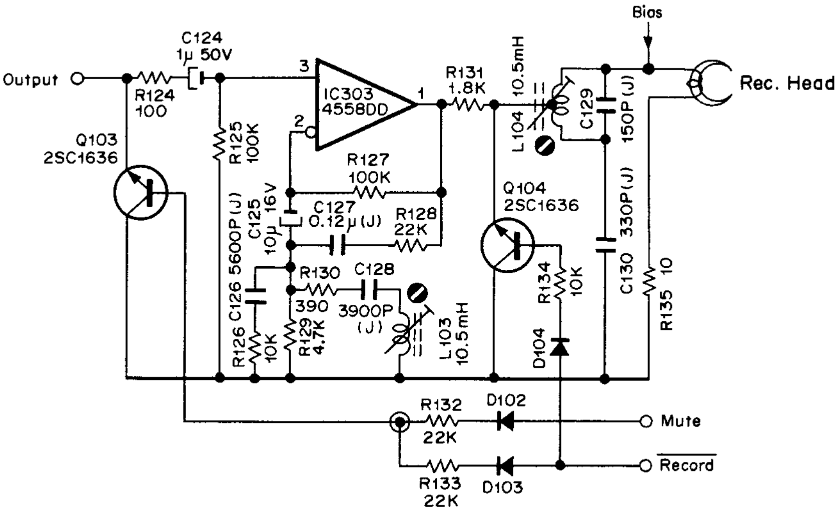

Bias
C124
1µ 50V
Output
R124
100
Q103
2SC1636
R125
100K
3
2
1
IC303
4558DD
R131
1.8K
L104 10.5mH
C129
150P(J)
Rec. Head
R127
100K
C125
10µ 16V
C127
0.12µ(J)
R128
22K
Q104
2SC1636
C130 330P(J)
R134
10K
R135 10
R126 C126 5600P(J)
10K
R130 C128
390 3900P
R129
4.7K
(J)
L103
10.5mH
D104
R132
22K
D102
Mute
R133
22K
D103
Record

Fig. 2.2.4 Record Amp. Circuit

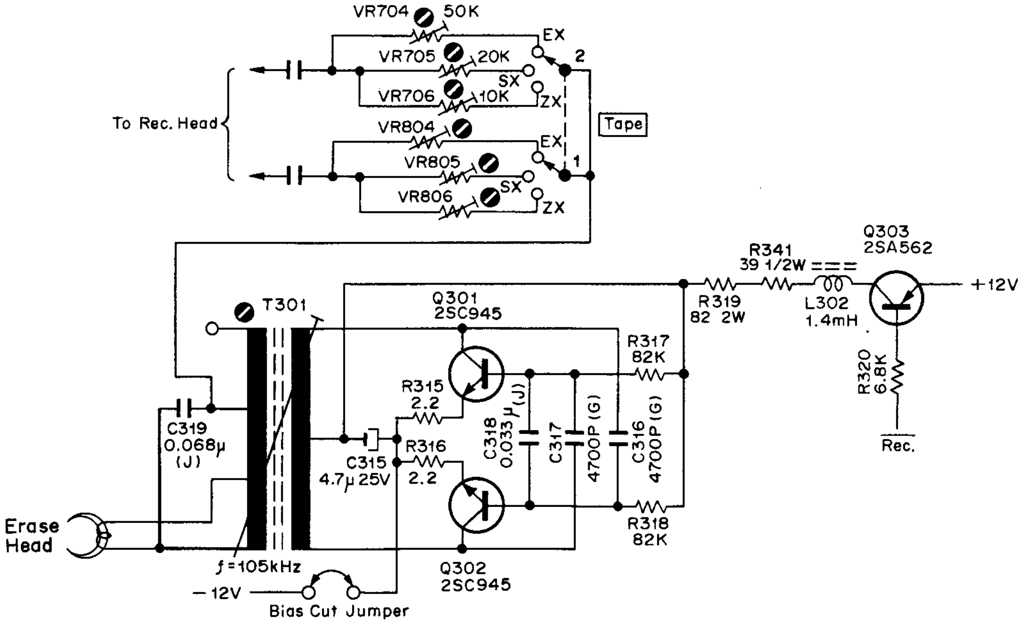

VR704 50K
EX
VR705 20K
2
SX
VR706 10K
ZX
To Rec. Head
Tape
VR804
EX
VR805
1
SX
VR806
ZX
T301
Q301
2SC945
R341
39 1/2W
Q303
2SA562
+12V
R319
82 2W
L302
1.4mH
R317
82K
R315
2.2
C318 0.033µ(J)
C317 4700P(G)
C316 4700P(G)
R320 6.8K
Rec.
C319
0.068µ
(J)
C315
4.7µ 25V
R316
2.2
R318
82K
Erase Head
f=105kHz
−12V
Bias Cut Jumper
Q302
2SC945

Fig. 2.2.5 Bias Osc. Circuit

2.2.4. Test Tone Circuit

Figs. 2.2.6-A and 2.2.6-B show the test tone circuit. By means of the operational amplifier IC, the N-581 oscillates 2 kinds of tones, which are 400 Hz (0 dB) for record level calibration and 15 kHz (−20 dB) for bias calibration. Meter amp. gain will be increased by 20 dB at 15 kHz, because R178 is added in parallel with R151. As shown in the figure, the test tone consists of oscillation portion through IC RC 4558D and band pass filter comprising either of 400 Hz or 15 kHz can be selected by the Test Tone Switch.

Power will be supplied to the test tone circuit when Power Switch is set to ON. IC301-1/2 consists of oscillation circuit, feeds its output back to input and oscillated square wave up to power source voltage level so that the oscillation voltage can be stabilized. A capacitor is connected to No. 6 terminal of the IC301-1/2 for convenience while changing over one frequency to another (400 Hz: 0.0114 μF, 15 kHz: 200 pF).

Band pass filter is created between IC301-1/2 and 2/2, and the sine wave of the selected frequency will be obtained at the output terminal 1 of the IC301-2/2. With regard to band pass filter curve, refer to Fig. 2.2.7.

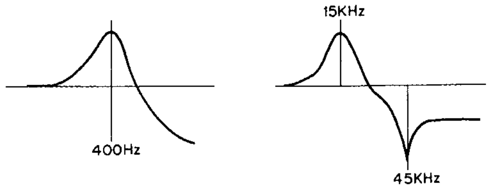


Fig. 2.2.7 Band Pass Filter Curve

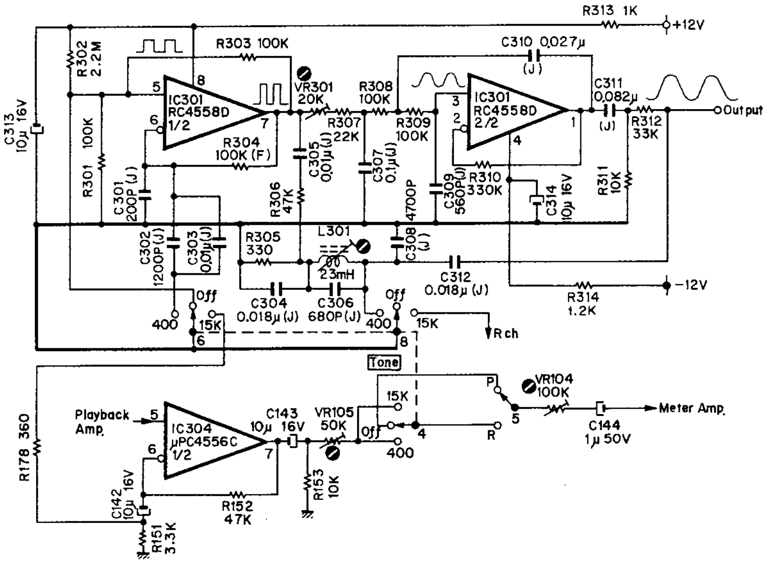

R313 1K
+12V
R303 100K
C310 0.027μ (J)
R302 2.2M
C313 10μ 16V
IC301 RC4558D 1/2
VR301 20K
R308 100K
IC301 RC4558D 2/2
C311 0.082μ (J)
R312 33K
Output
R307 22K
R309 100K
R304 100K (F)
C305 0.01μ (J)
C307 0.1μ (J)
4700P
C309 560P (J)
R310 330K
C314 10μ 16V
R311 10K
R301 100K
C301 200P (J)
R306 47K
C302 1200P (J)
C303 0.01μ (J)
R305 330
L301 23mH
C308 (J)
C312 0.018μ (J)
R314 1.2K
−12V
C304 0.018μ (J)
C306 680P (J)
Off
400
15K
6
8
Tone
Rch
Playback Amp.
IC304 μPC4556C 1/2
C143 10μ 16V
VR105 50K
15K
P
VR104 100K
Meter Amp.
C144 1μ 50V
4
R
5
R178 360
C142 10μ 16V
R152 47K
R153 10K
R151 3.3K

Fig. 2.2.6-A Test Tone Circuit

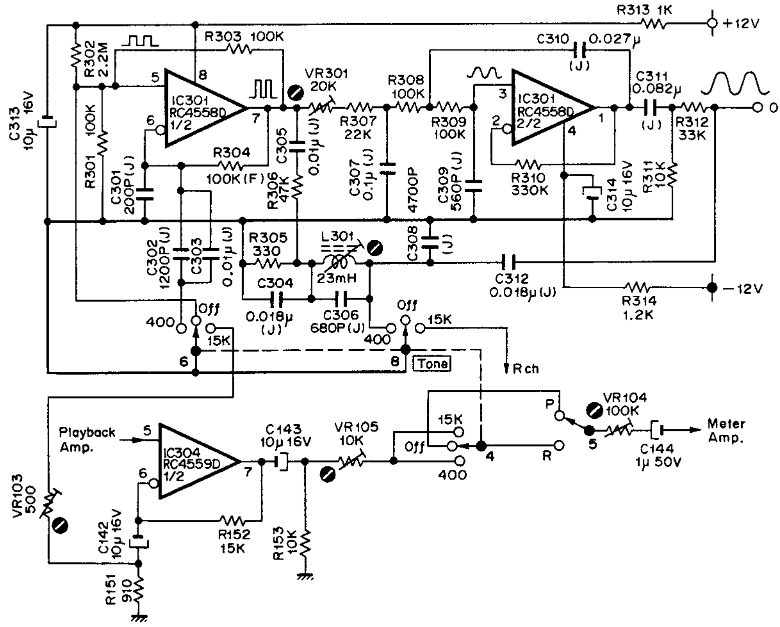

R313 1K
+12V
R303 100K
C310 0.027μ (J)
R302 2.2M
C313 10μ 16V
IC301 RC4558D 1/2
VR301 20K
R308 100K
IC301 RC4558D 2/2
C311 0.082μ (J)
R312 33K
Output
R307 22K
R309 100K
R304 100K (F)
C305 0.01μ (J)
C307 0.1μ (J)
4700P
C309 560P (J)
R310 330K
C314 10μ 16V
R311 10K
R301 100K
C301 200P (J)
R306 47K
C302 1200P (J)
C303 0.01μ (J)
R305 330
L301 23mH
C308 (J)
C304 0.018μ (J)
C306 680P (J)
C312 0.018μ (J)
R314 1.2K
−12V
Off
400
15K
6
8
Tone
Rch
Playback Amp.
IC304 RC4559D 1/2
C143 10μ 16V
VR105 10K
15K
P
VR104 100K
Meter Amp.
C144 1μ 50V
4
R
5
VR103 500
C142 10μ 16V
R152 15K
R153 10K
R151 910

Fig. 2.2.6-B Previous Type

2.3. Mechanism Control Circuits

2.3.1. Logic Control

Refer to Fig. 12.2 block diagram for mechanism control circuits.

(1) C-MOS IC

(a) Features of C-MOS IC

The IC's used in the logic circuit of the N-581 are of the C-MOS (complementary metal oxide semiconductor) type, in which P-channel and N-channel MOS FET's complement each other.

1) Small power consumption

A C-MOS is an inverter, as shown in Fig. 2.3.1.
Whether the input of this inverter is at "H" or "L" level, either the P-channel or N-channel MOS FET is OFF, and therefore, current does not pass from VDD to VSS under steady normal state. Consequently, when there is no input, power consumption (VDD x IDD) is nearly zero, except for surface and junction leakage.
When the input signal is switched from "H" to "L", or "L" to "H", however, both P- and N-channel FET's instantly come on, and a current flows either charging or discharging the stray output capacity, so that the power consumption during dynamic operation cannot be said to be zero.

2) A large noise margin

The input-output transmission characteristics of the C-MOS inverter differ from those of bipolar IC's as shown in Fig. 2.3.2. The knee characteristic is sharper, the threshold voltage is almost half of VDD, and the output amplitude is nearly equal to VDD - VSS.
Since the noise margin of a digital IC is defined as the difference between the minimum value of output amplitude and the minimum required amplitude of the input signal, it is quite natural that the C-MOS circuit, which produces an output amplitude of nearly VDD - VSS and is operated by a small input signal, should have a large noise margin.

3) High input impedance

A C-MOS IC has a very high input impedance because it is insulated from the substrate by the oxide film of the gate. Although leakage resistance must be considered in an actual C-MOS IC because diodes are usually used in the direction of reverse bias for protecting input circuit, its impedance is several tens of megohms. The advantage of a high input impedance is that the fan-out of the IC is large, which simplifies the interface. Also, a timer circuit for a longer period of time can be produced. This means that the high input impedance enables the input to be connected with a large resistance, but does not mean to use a capacitor of large capacity.

4) Wide operating voltage range

Fig. 2.3.3 shows input-output transfer characteristics of C-MOS. The general purpose C-MOS family has a wide operating voltage range extending from 3 to 18 V, which is much wider than that of TTL and DTL (5 ± 0.25 V), and HTL (15 ± 1.5 V). The reason for the C-MOS IC's wide operating voltage range is that the P-MOS and N-MOS are made symmetrical, and if VDD is varied, the threshold voltage for the circuit is always about half of VDD. In a bipolar IC, the threshold voltage is decided by the forward voltage from the base to the emitter of the transistor (VBE), and is little affected by the source voltage. Therefore, if the source voltage exceeds a certain limit, the output voltage and the threshold voltage will not balance, as a result of which operation will become impossible.
With a C-MOS, the threshold voltage varies according to changes in the source voltage, and stable operation throughout a wide range can be expected. As indicated above, the performance of a C-MOS IC as a digital IC is excellent.

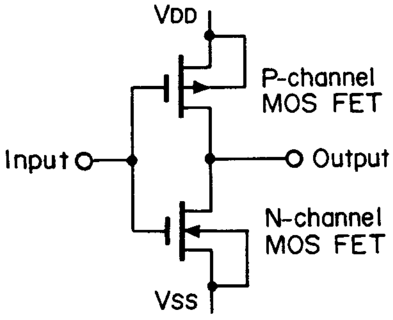


Fig. 2.3.1

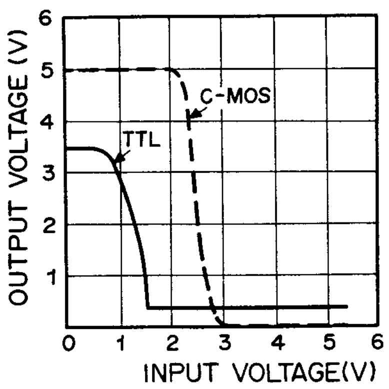


Fig. 2.3.2

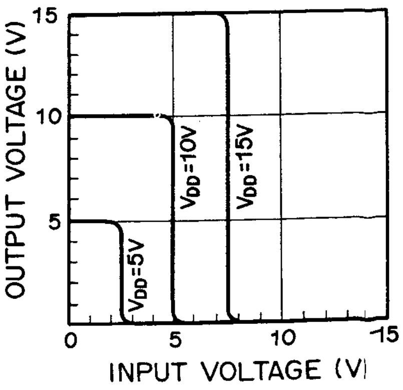


Fig. 2.3.3 Input-Output Transfer Characteristics of C-MOS

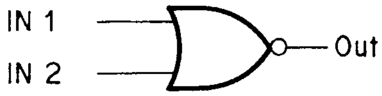
(b) Gate Logic

2-input NOR and NAND gates are used.

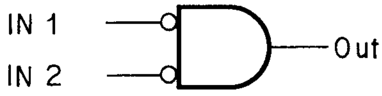
Following shows each logic symbol, truth table, pin assignment, and internal schematic diagram.

1) NOR Gate

The output will be H only if inputs IN1 and IN2 are L's, and the output will be L if IN1 is H or IN2 is H.
(H: +12 V, L: 0 V)



Out = $\overline{\text{IN1} + \text{IN2}}$



Out = $\overline{\overline{\text{IN1}} \cdot \overline{\text{IN2}}}$

Out = $\overline{\text{IN1} + \text{IN2}} = \overline{\text{IN1}} \cdot \overline{\text{IN2}}$

Fig. 2.3.4

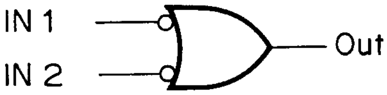
Truth Table 1

IN1	IN2	Out
L	L	H
L	H	L
H	L	L
H	H	L

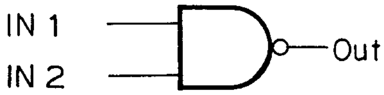
The construction of the foregoing 2 Logic Symbols is identical and intended to show the use of either OR or AND.

2) NAND Gate

The output will be L only if inputs IN1 and IN2 are H's, and the output will be H if IN1 is L or IN2 is L.



Out = $\overline{\text{IN1}} + \overline{\text{IN2}}$



Out = $\overline{\text{IN1} \cdot \text{IN2}}$

Out = $\overline{\text{IN1} \cdot \text{IN2}} = \overline{\text{IN1}} + \overline{\text{IN2}}$

Fig. 2.3.7

Truth Table 2

IN1	IN2	Out
L	L	H
L	H	H
H	L	H
H	H	L

The construction of the foregoing 2 Logic Symbols is identical and intended to show the use of either AND or OR.

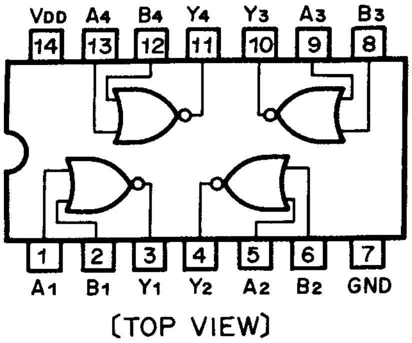

VDD
A4
B4
Y4
Y3
A3
B3
14
13
12
11
10
9
8
1
2
3
4
5
6
7
A1
B1
Y1
Y2
A2
B2
GND
〔TOP VIEW〕

Fig. 2.3.5

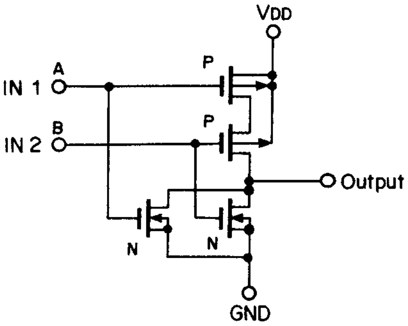

VDD
A
IN 1
P
B
IN 2
P
Output
N
N
GND

Fig. 2.3.6

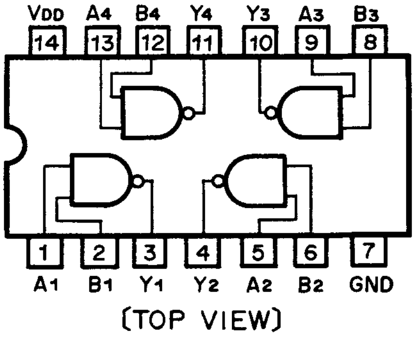

VDD
A4
B4
Y4
Y3
A3
B3
14
13
12
11
10
9
8
1
2
3
4
5
6
7
A1
B1
Y1
Y2
A2
B2
GND
〔TOP VIEW〕

Fig. 2.3.8

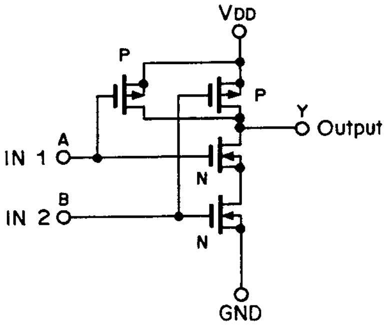

VDD
P
P
Y
Output
A
IN 1
N
B
IN 2
N
GND

Fig. 2.3.9

(c) Gated Flip-Flop

The two NAND gates can be used to form flip-flop. The inputs operate as follows:

When both S and R are H's, the flip-flop will remain in its present state, i.e., will not change the state.

If however, the R input goes to L, the NAND gate connected to R will have H output regardless of the other feedback input to the NAND gate, and this will force the flip-flop to the L state (provided the S input is kept H). Similar reasoning shows that making the S input an L will cause the NAND gate at the S input to have an H output, forcing the flip-flop to the H state (again provided the R input is kept H).

If both inputs R and S are made L's, the next state will depend on which input is returned to H first, and if both are returned to H simultaneously, the resulting state of the flip-flop will be indeterminate. As a result, this is a "forbidden" or "restricted" input combination.

In the actual use, the activation speed of the flip-flop is managed to be delayed in order to prevent erroneous movements caused by noise as shown in Fig. 2.3.11.

Truth Table 3

Set	Reset	Q	$\overline{Q}$	Remarks
L	L	H	H	*: Maintains the previous state.
L	H	H	L	
H	L	L	H	
H	H	*	*	

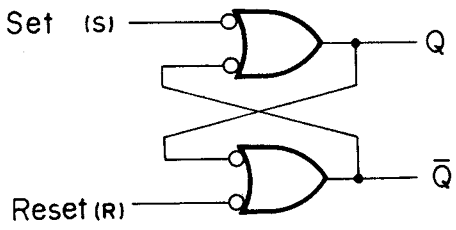


Fig. 2.3.10

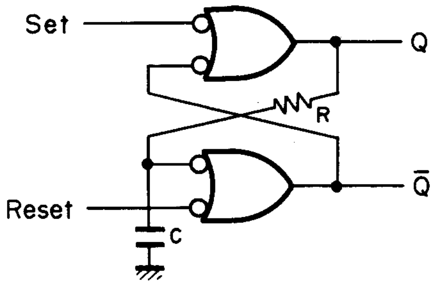


Fig. 2.3.11

(d) Compatible C-MOS ICs

IC401, 402, 403 : μPD4011C, CD4011A, MC14011A, F34011A, TP4011A, TC4011P

IC404 : μPD4001C, CD4001A, MC14001A, F34001A, TP4001A, TC4001P

(2) Logic Control and Other Circuits

A foolproof operation will be done by logic control. For example, when command the playback mode while fast winding or command fast-forward mode while rewinding, it is guaranteed that no abnormal tape tension will happen by passing through the stop mode. This is also guaranteed even when the switches are pressed simultaneously.

(a) Logic Signal

How to read signals is referred to the following:

Positive logic is used; the signal H shows the condition that the signal is executing, and in case there is a – on the signal, signal L shows the condition that the signal is executing.

1) $\overline{\text{Kstop}}$ (Stop switch output signal)
   $\overline{\text{Kstop}}$ becomes L when the Stop switch is pressed, and $\overline{\text{Kstop}}$ is H while switch is open.
   In other words, $\overline{\text{Kstop}}$ = L shows while Stop mode is commanded, and $\overline{\text{Kstop}}$ = H shows stop is not commanded.
2) $\overline{\text{PLAY}}$ (Play Flip-Flip $\overline{Q}$ output signal)
   $\overline{\text{PLAY}}$ = H: out of Play mode
   $\overline{\text{PLAY}}$ = L: in Play mode
3) PLAY (Play Flip-Flop Q output signal)
   PLAY = H: in Play mode
   PLAY = L: out of Play mode

(b) Logic Operating Status

Refer to Fig. 2.3.12 (Logic Status).

Each stage of logic status under the series control switch operation is shown in the figure.

(c) Conditions of Flip-Flops

1) FF Flip-Flop
   Set = $\overline{\text{Kff}}$
   Reset = $\overline{\text{Kplay}}$ + $\overline{\text{Krew}}$ + $\overline{\text{Kstop}}$
2) REW Flip-Flop
   Set = $\overline{\text{Krew}}$
   Reset = $\overline{\text{Kplay}}$ + $\overline{\text{Kff}}$ + $\overline{\text{Kstop}}$ + $\overline{\text{Memory Rewind}}$
   ($\overline{\text{Memory Rewind}}$ = L: With Memory switch ON, a differential L pulse generates when the tape counter reaches "999".)
3) PLAY Flip-Flop
   Set = $\overline{\text{Kplay}}$
   Reset = $\overline{\text{Kff}}$ + $\overline{\text{Krew}}$ + $\overline{\text{Kstop}}$ + $\overline{\text{PAUSE}}$

4) PAUSE Flip-Flop

Set = $\overline{\text{Kpause}}$

Reset = $\overline{\text{Kplay}}$ + $\overline{\text{Kstop}}$ + (the rising of the FAST signal)

(FAST = FF + REW. When FAST signal becomes H, a differential pulse is generated at the rising of the signal. This pulse conducts Q404 to turn ON, accordingly PAUSE Flip-Flop is reset.)

5) REC Flip-Flop

Set = $\overline{\text{Krec}}\cdot\overline{\text{FAST}}\cdot\overline{\text{PAUSE}}\cdot\overline{\text{PLAY}}\cdot$Record Protector Switch OFF

= $\overline{\text{Krec}}\cdot\overline{\text{FAST}}\cdot$Q405 OFF

(Q405 OFF = $\overline{\text{PAUSE}}\cdot\overline{\text{PLAY}}\cdot$ Record Protector Switch OFF)

Reset = $\overline{\text{PLAY}\cdot\text{PAUSE}}$ = Q406 ON

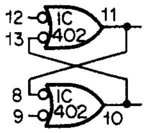
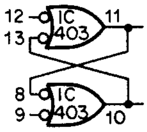
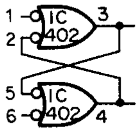
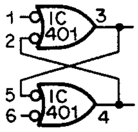
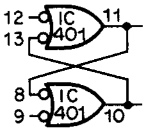
MODE	STOP	RECORD				PLAY-BACK	FAST WIND		CUE
CONTROL SWITCH	STOP	RECORD	RECORD PAUSE	PLAY	PAUSE	PLAY	FF	REW	PAUSE
 PLAY	L	L	L	H	L	H	L	L	L
$\overline{\text{PLAY}}$	H	H	H	L	H	L	H	H	H
 REC	L	H	H	H	H	L	L	L	L
$\overline{\text{REC}}$	H	H	L	L	L	H	H	H	H
 PAUSE	L	L	H	L	H	L	L	L	H
$\overline{\text{PAUSE}}$	H	H	L	H	L	H	H	H	L
 FF	L	L	L	L	L	L	H	L	L
$\overline{\text{FF}}$	H	H	H	H	H	H	L	H	H
 REW	L	L	L	L	L	L	L	H	H
$\overline{\text{REW}}$	H	H	H	H	H	H	H	L	L
$\overline{\text{REC}}$ (Q421 Collector)	H	H	L	L	L	H	H	H	H
MUTE (Q424 Collector)	H	H	L	L	L	L	H	H	L
$\overline{\text{CUE}}$ (Q426 Collector)	H	H	H	H	H	H	H	H	L

Fig. 2.3.12 Logic Status

(d) Initial Reset and Power Mute

Refer to Fig. 2.3.13 circuit diagram and Fig. 2.3.14 timing chart.

When the power switch is turned ON, the voltage of the power source increases from 0 to +12 V DC. After this voltage is built up, Q403 is turned ON and the mute signal is generated, until C402 is charged through R404, R405, and R406. At the same time, this signal enters the base of Q417 in the automatic shut-off circuit, and turns this transistor ON so that it generates $\overline{\mathrm{Kstop}}$ = L pulse.

When the power switch is turned OFF, the signal from the secondary winding of the transformer entering Q401 soon ceases and Q401 is in the cutoff state. Since the base of Q402 is positively charged, Q402 comes ON, which turns Q403 ON and produces the $\overline{\mathrm{Kstop}}$ = L pulse. The $\overline{\mathrm{Kstop}}$ = L pulse resets each flip-flop to its initial condition (the stop condition).

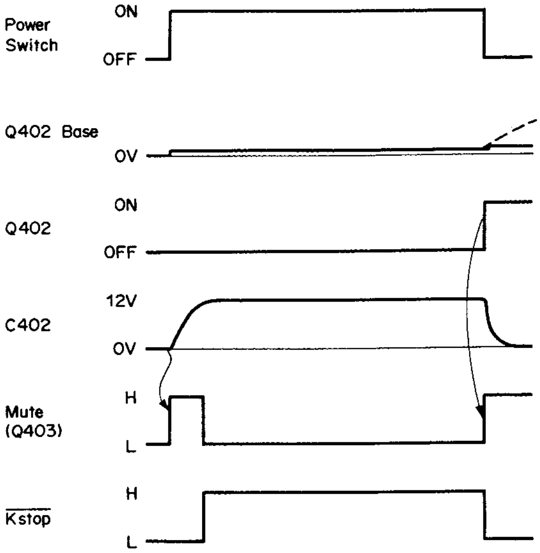


Fig. 2.3.14 Timing Chart

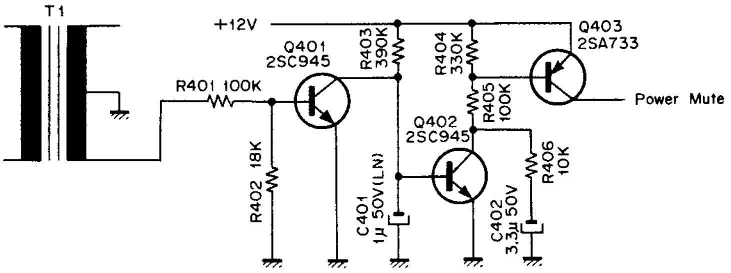


Fig. 2.3.13 Initial Reset and Power Mute Circuit

(e) One-shot Pulse-generating Circuit

Refer to Fig. 2.3.15 circuit diagram and Fig. 2.3.16 timing chart.

The circuit consists of IC403-4,5, and 6, IC403-1, 2, and 3, Q407, R420, R421, C412, etc. When the mode is changed as shown below, the circuit generates a one-shot pulse of approximately 400 msec, so that this period passes in the stop mode, and as soon as this is over, a new mode is set:

From FAST (FF or REW) mode to PLAY or PAUSE mode;

From PLAY mode to FAST (FF or REW) mode;

From FF mode to REW mode, or vice versa.

This interval is necessary to avoid an extraneously large tension on the tape, in view of the response of the tape deck mechanism.

1) From PLAY mode to FF mode

Since the PLAY flip-flop is set during playing, IC403-6 is H and IC403-5 is L, and therefore, IC403-4 is H and C412 is charged to +12 V. Consequently, IC403-3 is L, and the gates connected to IC403-3 are open.

When the FF switch is pressed the PLAY flip-flop is reset, and at the same time, the FF flip-flop is set. However, the capacitor C413 connected to the PLAY flip-flop retards so that PLAY = L. Therefore, FF = H and PLAY = H for a short period, and a narrow pulse is produced in IC403-4. C412 is discharged by this L pulse, but it is charged again through R420 and R421 when the L pulse is released. IC403-3 is maintained at H for approximately 400 msec, until the voltage of C412 exceeds the threshold of IC403-1 and 2, and the gates connected to IC403-3 are closed to bring about the stop condition.

2) From FF mode to REW mode

When the REW switch is pressed, the FF flip-flop is reset, and the REW flip-flop is set. As in case 1), a narrow H pulse is generated in the base of Q407, cutting off Q407, and as a result, C412 is discharged through D411. The subsequent actions are the same as in 1).

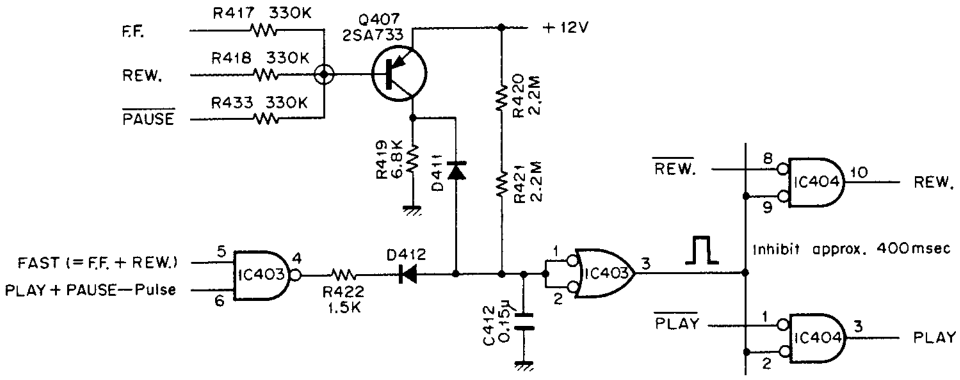

F.F.
R417 330K
REW.
R418 330K
PAUSE
R433 330K
Q407
2SA733
+12V
R420 2.2M
R419 6.8K
D411
R421 2.2M
REW.
8
9
IC404
10
REW.
FAST (= F.F. + REW.)
PLAY + PAUSE—Pulse
5
6
IC403
4
R422 1.5K
D412
C412 0.15μ
1
2
IC403
3
Inhibit approx. 400msec
PLAY
1
2
IC404
3
PLAY

Fig. 2.3.15 One-shot Pulse-generating Circuit

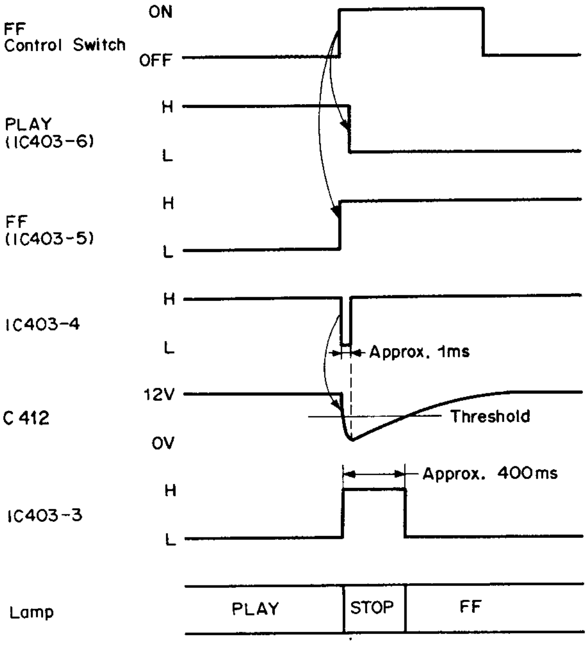

FF Control Switch
ON
OFF
PLAY (IC403-6)
H
L
FF (IC403-5)
H
L
IC403-4
H
L
Approx. 1ms
C 412
12V
0V
Threshold
Approx. 400ms
IC403-3
H
L
Lamp
PLAY
STOP
FF

Fig. 2.3.16 Timing Chart

(f) Unattended RECORD/PLAY

Unattended recording or playback can be carried out by the use of the Tape Start Memory/Timer Switch. When the power is connected a differential pulse is supplied to Q415 through C420, and Q415 is turned ON. Therefore, when the Tape Start Memory/Timer Switch is moved to REC side, D424 and D425 are grounded through Q415, and the RECORD mode is selected. When it is moved to the PLAY side, only D425 is grounded, and the PLAYBACK mode is selected.

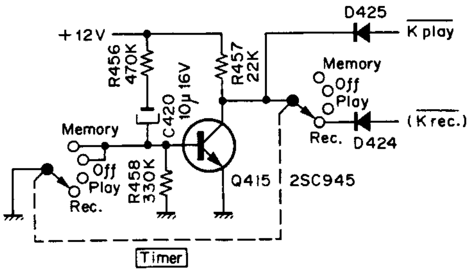

+12V
R456 470K
C420 10μ 16V
R457 22K
D425
K play
Memory
Off
Play
(K rec.)
Rec.
D424
Memory
Off
Play
Rec.
R458 330K
Q415
2SC945
Timer

Fig. 2.3.17 Unattended Record/Play Circuit

(g) $\overline{\text{REC}}$ Signal

Refer to Fig. 2.3.18. This is the signal that controls bias oscillation in the amplifier circuit. In RECORD/PLAY and RECORD/PAUSE modes, $\overline{\text{REC}}$ = L, and bias oscillation is started. Q421 is turned ON when the REC flip-flip is H and Q422 is OFF, i.e., when the cam selects PLAY or PAUSE mode mechanically, and $\overline{\text{REC}}$ = L.

(h) $\overline{\text{CUE}}$ Signal

Refer to Fig. 2.3.18. When the PAUSE switch is pressed during the FAST (FF or REW) mode, $\overline{\text{CUE}}$ = L, and the output level of the amplifier circuit is attenuated. Q426 is turned ON at FAST/PAUSE, thus $\overline{\text{CUE}}$ = L.

(i) Mute Signal

Refer to Fig. 2.3.18. When Q424 is ON and when the Mute-power is H through D434, MUTE = H and the amplifier circuit is muted.

$$\text{Q424 ON} = \text{Q423 OFF } (=\overline{\text{CUE}}\cdot\overline{\text{REC}})\cdot(\text{STOP} + \text{PAUSE} + \text{Q425 ON } (\overline{\text{PLAY–Position}})$$

The modes in which the amplifier circuit is not muted are (MUTE = L):

$$\text{Q424 OFF} = \overline{\text{Q424 ON}} = \text{CUE} + \text{REC} + \overline{\text{STOP}}\cdot\overline{\text{PAUSE}}\cdot\text{PLAY–Position}$$

i.e., the FAST/PAUSE (i.e., CUE) mode, RECORD or RECORD/PAUSE mode, and PLAYBACK mode.

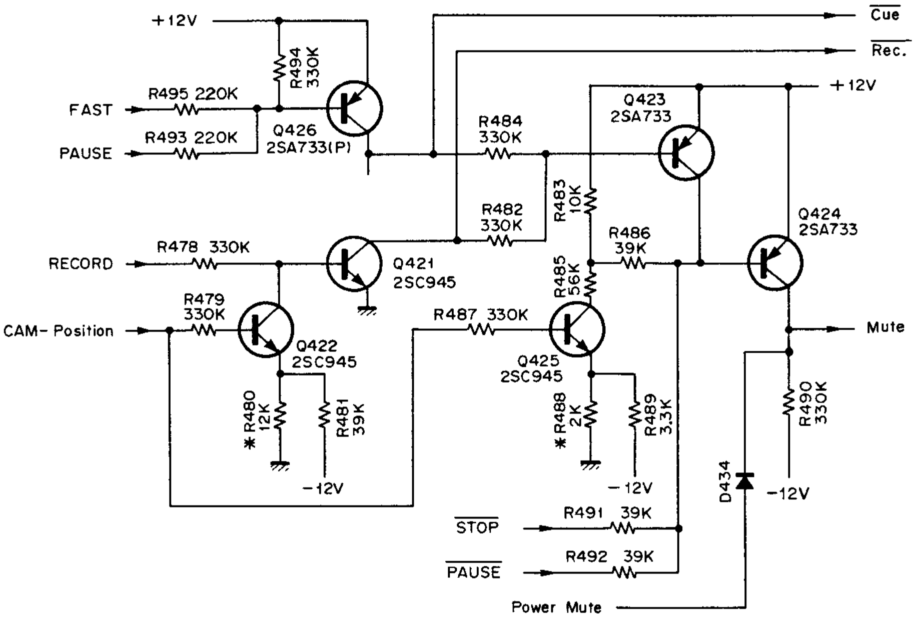

+12V
R494 330K
R495 220K
FAST
R493 220K
PAUSE
Q426 2SA733(P)
Cue
Rec.
+12V
Q423 2SA733
R484 330K
R483 10K
R482 330K
R486 39K
Q424 2SA733
R478 330K
RECORD
Q421 2SC945
R485 56K
R479 330K
CAM- Position
R487 330K
Q422 2SC945
Q425 2SC945
Mute
✱R480 12K
R481 39K
✱R488 2K
R489 3.3K
R490 330K
-12V
-12V
D434
-12V
R491 39K
STOP
R492 39K
PAUSE
Power Mute

Fig. 2.3.18

(j) Take-up Function at Loading

Refer to Fig. 2.3.19. SW503 Eject Switch is closed when eject is made. When a cassette tape is inserted into the Cassette Case Ass'y and loaded, SW503 will become open. Therefore, plus voltage is applied at No. 2 pin of IC405 until C428 (4.7μF 25V) is charged up through R542 (2.2 MΩ).

Accordingly Reel Motor rotates forwardly and eliminates tape loosening of the cassette tape if any.

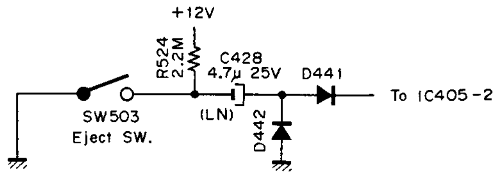

+12V
R524 2.2M
C428 4.7μ 25V
D441
To IC405-2
SW503 Eject SW.
(LN)
D442

Fig. 2.3.19

2.3.2. Shut-off Sensor and Detector

Refer to Fig. 2.3.20 circuit diagram and Fig. 2.3.21 timing chart.

(1) Shut-off sensor

Light from lamp PL501 is projected through holes in a disc rotating synchronously with the take-up reel, and the intermittent flashes coming through the disc are converted into electrical signals by a phototransistor (Q602). These signals are amplified into square waves, and transmitted to the shut-off detector in the subsequent stage. When the tape-end comes, the take-up reel and the disc stop rotating, and no pulse is output from the sensor.

(2) Shut-off detector

The shut-off detector, which receives the pulse output from the sensor, produces the shut-off signal (i.e., $\overline{\text{Kstop}}$ = L) having detected a certain period of absence of pulse, and this signal resets each flip-flop in the logic control circuit.

(a) Through C421, Q416 is ON and discharges C422 at every H cycle of the sensor output pulse. On the other hand, C422 (1 μF) is charged through R461 (2.2 MΩ) in the PLAY (Playback or Record) mode or the FAST (FF or REW) mode.

(b) At the end of the tape, no sensor output is produced and Q416 is not turned ON, resulting in C422 being charged continuously. When the voltage of C422 exceeds the sum of the emitter voltage (approx. 1.1 V) and the VBE of Q417, Q417 is turned ON and transmits the shut-off signal ($\overline{\text{Kstop}}$ = L) to the logic control circuit.

(c) In the STOP mode, C422 is grounded through D426 and R459, and the shut-off detection function is made inoperative. When PAUSE switch is pressed, C422 is discharged through D437.

(d) Q417 is turned ON by the mute-power signal generated whenever power is turned ON or OFF, and produces the $\overline{\text{Kstop}}$ = L pulse.

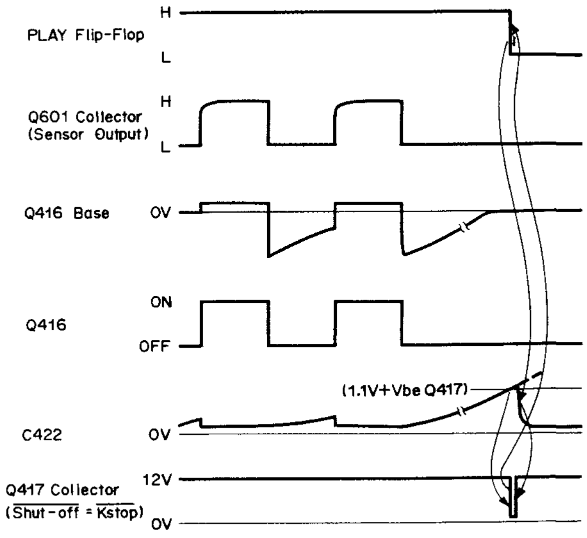


Fig. 2.3.21 Timing Chart

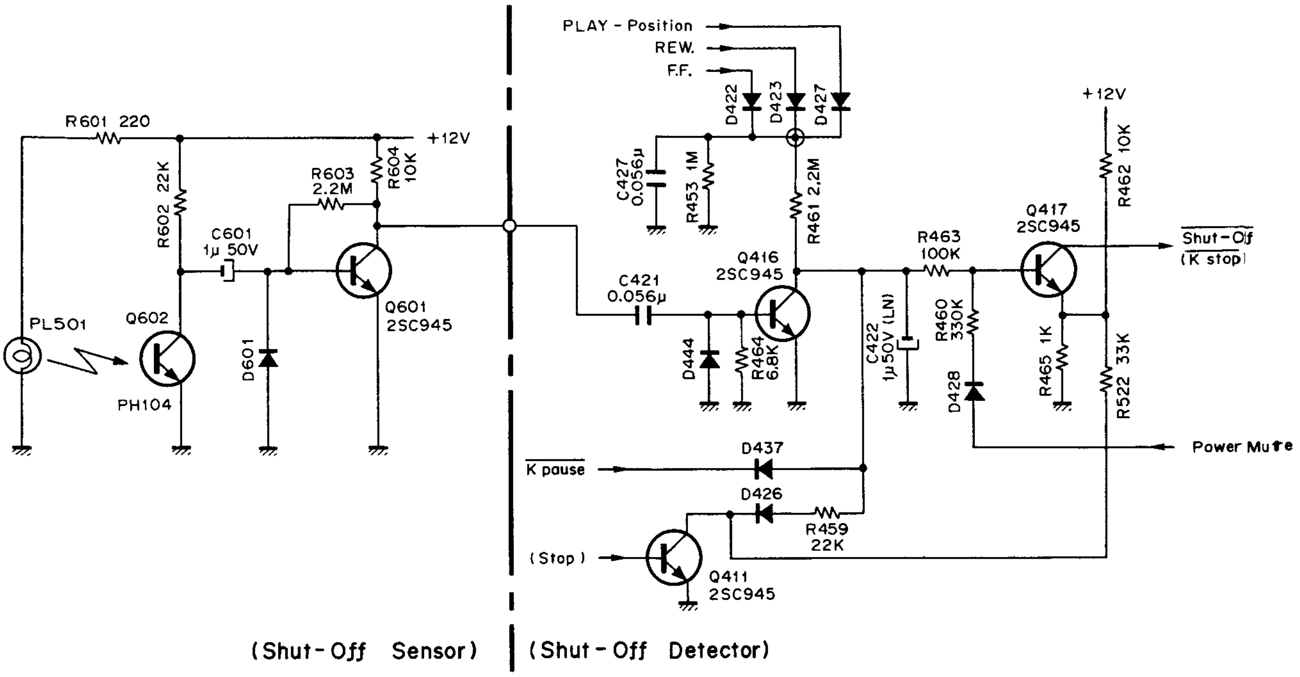

R601 220
+12V
R602 22K
R603 2.2M
R604 10K
C601 1μ 50V
PL501
Q602
PH104
D601
Q601 2SC945
PLAY - Position
REW.
F.F.
D422
D423
D427
C427 0.056μ
R453 1M
R461 2.2M
C421 0.056μ
Q416 2SC945
D444
R464 6.8K
C422 1μ50V (LN)
R463 100K
R460 330K
D428
Q417 2SC945
R465 1K
+12V
R462 10K
R522 33K
$\overline{\text{Shut-Off}}$ ($\overline{\text{K stop}}$)
Power Mute
D437
$\overline{\text{K pause}}$
D426
R459 22K
(Stop)
Q411 2SC945
(Shut-Off Sensor)
(Shut-Off Detector)

Fig. 2.3.20 Shut-OFF Sensor and Detector Circuit

2.3.3. Control Motor Drive Circuit

Refer to Fig. 2.3.22 circuit diagram and Fig. 2.3.23 timing chart for the series control switch operation. The control motor is turned by varying amounts, according to which control switch is set. This motor is connected to the mechanism control cam, and the mechanism of the N-581 is set to the mode indicated by this cam. The motor is driven by the differential amplifier (IC405) and drivers Q431 and Q432. When the motor has stopped, the voltage at the sliding contact of the cam control variable resistor moving synchronously with the motor (control voltage) is balanced with the reference voltage corresponding to each mode, and the input difference of the differential amplifier is zero. When a new mode is demanded, a different reference voltage breaks the balance at the differential amplifier, and the motor operates.

The motor drives the cam control variable resistor and changes the control voltage. When the control voltage is changed and the input difference of the differential amplifier becomes zero, the motor stops.

The following table shows the position of the cam and the voltage at the sliding contact of the cam control variable resistor:

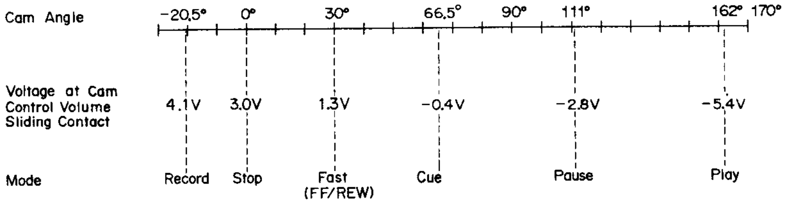
Position on Cam	Voltage at Sliding Contact of Cam Control Volume
Stop	3.0 V
Rec	4.1 V
FF/REW	1.3 V
Pause	−2.8 V
Play	−5.4 V
Cue	−0.4 V

State of transistors in each mode:

STOP:	Q427, Q428, Q429, Q430 OFF
PLAY:	Q429 ON
FF/REW:	Q428, Q430 ON
REC:	Q427, Q430 ON (in the form of pulse)
PAUSE:	Q429 ON
CUE:	Q428, Q429, Q430 ON

RECORD mode

When RECORD switch and PLAY switch are pressed, Q427 pulses ON and OFF through C426, and the cam moves to the RECORD position. Then cam moves to the PLAY position and stays there, thus the mechanism is set to the RECORD mode.



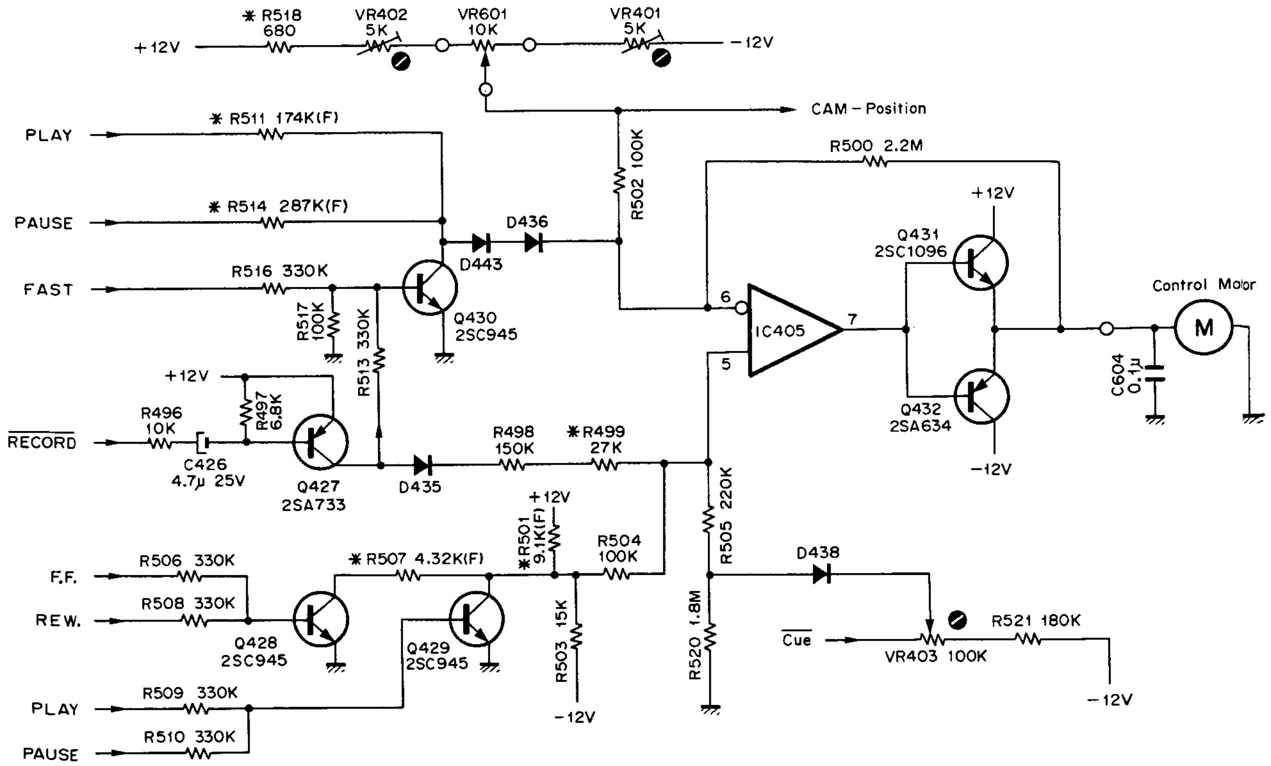

+12V
✱R518 680
VR402 5K
VR601 10K
VR401 5K
−12V
CAM−Position
PLAY
✱R511 174K(F)
PAUSE
✱R514 287K(F)
FAST
R516 330K
R517 100K
R513 330K
R502 100K
D436
D443
Q430 2SC945
R500 2.2M
+12V
Q431 2SC1096
6
7
5
IC405
Control Motor
M
C604 0.1µ
Q432 2SA634
−12V
+12V
R496 10K
R497 6.8K
RECORD
C426 4.7µ 25V
Q427 2SA733
D435
R498 150K
✱R499 27K
R505 220K
+12V
✱R501 9.1K(F)
R504 100K
F.F.
R506 330K
✱R507 4.32K(F)
REW.
R508 330K
Q428 2SC945
Q429 2SC945
R503 15K
−12V
R520 1.8M
D438
Cue
VR403 100K
R521 180K
−12V
PLAY
R509 330K
PAUSE
R510 330K

Fig. 2.3.22 Control Motor Drive Circuit

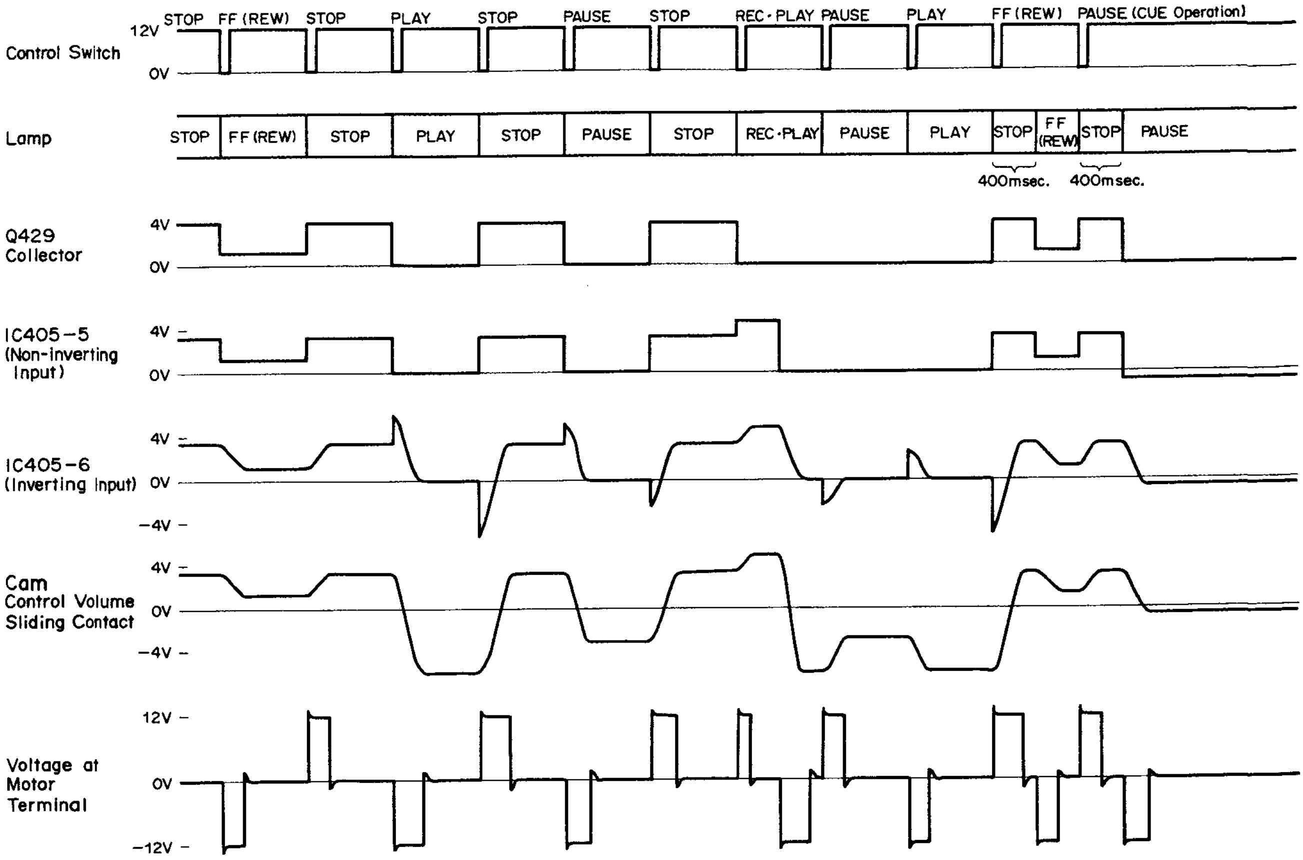


Fig. 2.3.23 Timing Chart

2.3.4. Capstan Motor Governor

This is a governor employing a PLL (phase-locked loop) IC, and drives the capstan motor at a constant speed when the power switch is turned ON.

2.3.5. Reel Motor Governor

Refer to Fig. 2.3.24 circuit diagram and Fig. 2.3.25 timing chart.

This is a governor controlling the reel motor speed and it consists of a differential amplifier, IC405, and motor drivers, Q419 and Q420, etc. The speed of the motor varies as follows:

(1) PLAY

Q418 is ON and IC405-2 (inverting input) is supplied with a positive voltage, and Q420 is conducted. The motor is kept running at a constant speed by the governor.

(2) FF or REW

A positive voltage is supplied to IC405-2 in the FF mode, when Q420 is saturated, and in the REW mode, to IC405-3 (non-inverting input), when Q419 is saturated. Therefore, the governor function does not operate and the motor turns forward or in reverse, depending on wheather is supplied with an approximately -12 V or +12 V voltage.

(3) PAUSE switch pressed during FF or REW (i.e., CUE)

Q413 is turned ON and the input voltage to IC405 is decreased, and the motor speed is reduced to approx. 1/3 of that for FF or REW. The motor is kept running at a constant speed by the governor.

(4) FF or REW switch kept further pressed in state (3)

Since R477 is grounded through D431 or D432, the input voltage to IC405 is further decreased, and the motor speed is reduced to approx. 3/5 of that for CUE (approx. 1/5 of that for FF or REW).

The motor is kept running at a constant speed by the governor.

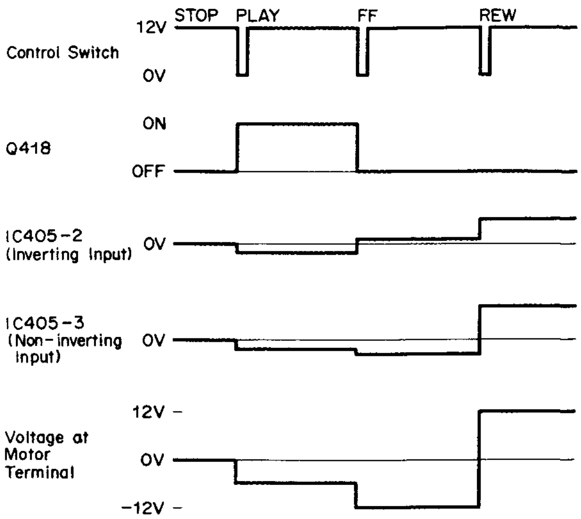


Fig. 2.3.25 Timing Chart

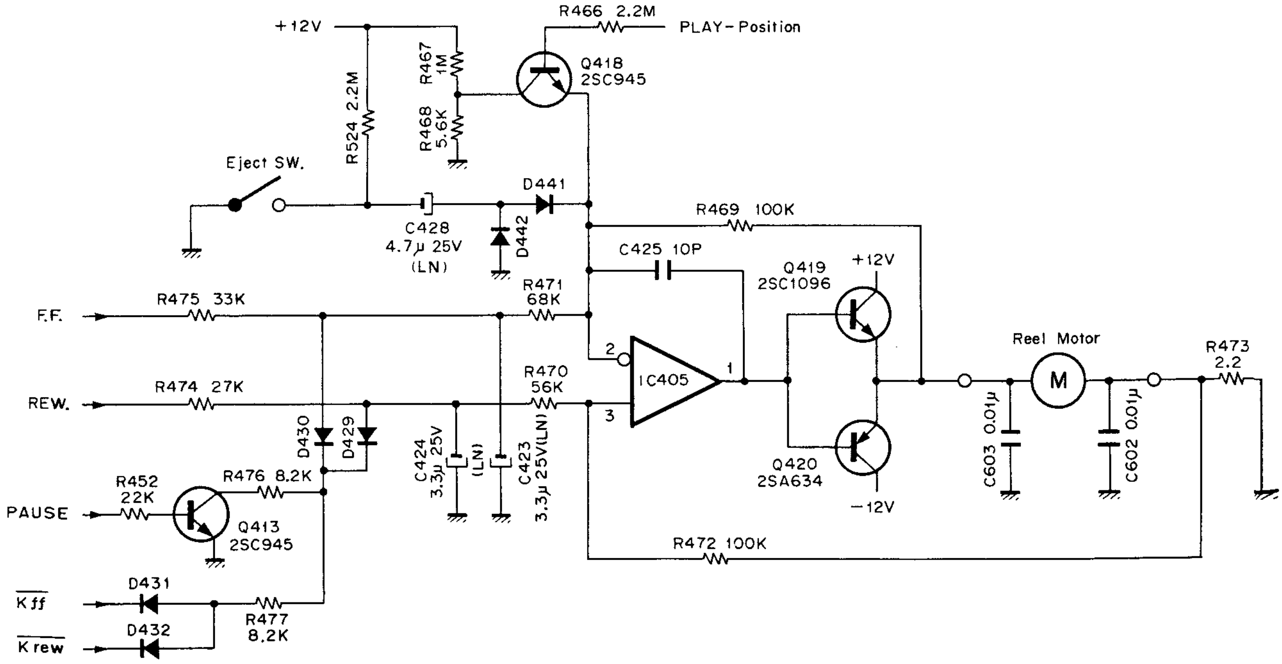

+12V
R524 2.2M
R467 1M
R468 5.6K
R466 2.2M
PLAY-Position
Q418 2SC945
Eject SW.
C428 4.7μ 25V (LN)
D441
D442
R469 100K
C425 10P
R471 68K
Q419 2SC1096
+12V
F.F.
R475 33K
REW.
R474 27K
R470 56K
2
3
1
IC405
D430
D429
C424 3.3μ 25V (LN)
C423 3.3μ 25V (LN)
Q420 2SA634
-12V
Reel Motor
M
C603 0.01μ
C602 0.01μ
R473 2.2
R452 22K
PAUSE
R476 8.2K
Q413 2SC945
R472 100K
D431
Kff
D432
Krew
R477 8.2K

Fig. 2.3.24 Reel Motor Drive Circuit

2.4. Remote Control Unit RM-580 (Optional)

2.4.1. Introduction

The RM-580 is a remote controller for the N-581 consisting of a transmitter and a receiver. The transmitter transmits infrared control information which is received by a photosensitive diode in the receiver. The information is amplified and transmitted to the N-581 in order to control the tuning, volume, power supply and the auto-tuning of the N-581. See Fig. 2.4.1.

The control information is in the form of pulses with a frequency of approx. 22 kHz, transmitted with infrared rays.

Each unit of information consists of 7 bit and is transmitted in 10.5 ms. The first of the 7 bit is the start bit, the others being information bit. There is a time interval of 164 ms between each 7-bit unit of information and the next. See Fig. 2.4.2.

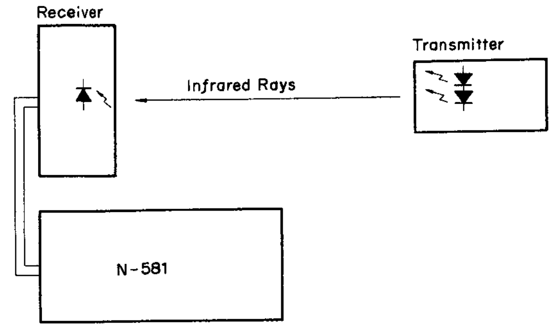

Receiver
Transmitter
Infrared Rays
N-581

Fig. 2.4.1 RM-580 Connecting Diagram

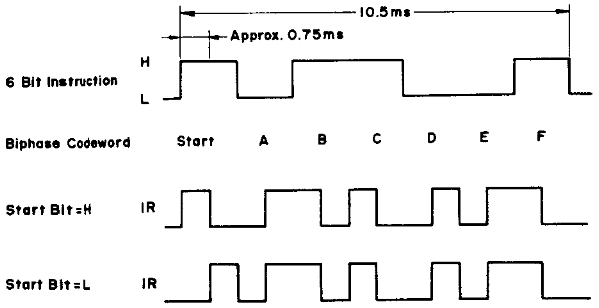

10.5ms
Approx. 0.75ms
H
6 Bit Instruction
L
Biphase Codeword
Start
A
B
C
D
E
F
Start Bit=H
IR
Start Bit=L
IR

Fig. 2.4.2 Information Unit

2.4.2. Transmitter

The transmitter consists of a matrix key having various operation switches, a system IC for transmission, and an LED driving unit. See Fig. 2.4.3.

(1) Matrix key

The matrix key consists of six microswitches and six transistors: play, stop, rewind, f.f., record and pause.

(2) System IC for transmission

The system IC for transmission consists of IC901, the turn-ON transistor Q908, and an additional clock generator circuit.

Terminal No. 1 is connected to a positive power source and Terminal No. 6 is grounded through Q908. Since a battery is used in the RM-580 it is designed so that the power is consumed only when the matrix key is depressed and the information is transmitted.

When one of 1 to 8 and one of a to d of the keyboard scanning section of IC901 are shortcircuited, the turn-ON control section within the IC causes the voltage level at Terminal 7 of IC901 to become H. Then, Q908 is turned ON. Terminal 6 of IC901 is grounded, and the information is given from Terminal 8 through the output section. Terminals 2 to 5 correspond to a to d, and Terminals 9 to 16 correspond to 1 to 8 of the keyboard scanning section. If 1 and a of the keyboard scanning section are shortcircuited, a unit of information is generated, and if 1 and b are shortcircuited, another unit of information is generated. Thus, 32 kinds of information can be obtained from Terminal 8 through the output section. The external circuit of the clock generator used to make the pulses for information transmission is connected to Terminals 17 and 18 of IC901. The frequency is determined by the adjustment of L901.

(3) LED driver

The LED driver consists of Q909 and Q910 connected to Terminal 8 of IC901, and photodiodes D907 and D908. It converts the output information into infrared signals having considerable power.

The signal from Terminal 8 of IC901 becomes the base current of Q909 whose collector current is the base current of Q910 and the collector current from Q910 flowing to LED's D907 and D908 acts to transmit the information. D904, D905, D906, R925 and R926 compose a protective circuit to restrict the current to the LED's.

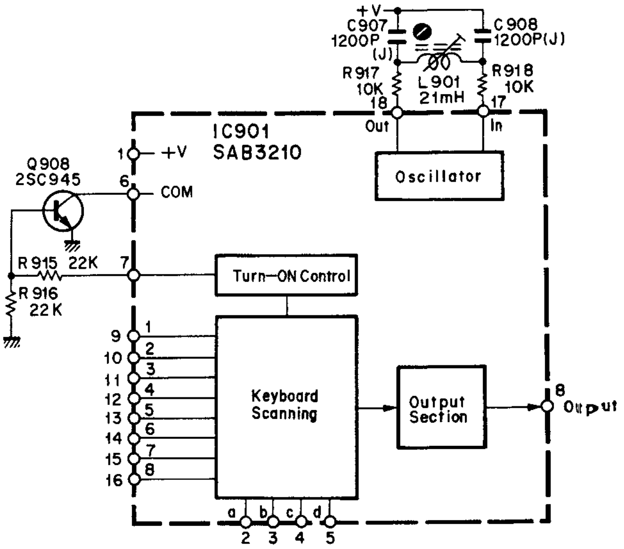

+V
C907
1200P
(J)
C908
1200P(J)
R917
10K
L901
21mH
R918
10K
18
17
Out
In
IC901
SAB3210
1 +V
6 COM
Q908
2SC945
Oscillator
R915 22K
7
R916
22K
Turn-ON Control
9
10
11
12
13
14
15
16
1
2
3
4
5
6
7
8
Keyboard Scanning
Output Section
8
Output
a
b
c
d
2
3
4
5

Fig. 2.4.3 Transmission IC System Diagram

2.4.3. Receiver

The receiver consists of a signal input, a signal amplifier, a system IC for reception, an instantaneous system IC power-disconnecting switch, a buffer amplifier, and an information processor.

(1) Signal input

The signal input consists of a photodiode D001, a transistor Q001 and a parallel resonance circuit.

The infrared signal radiated from the transmitter is received by the photodiode D001 and converted into a current. The current is amplified in the parallel resonance circuit consisting of C001, L001 and R001, and is further amplified by Q001.

The parallel resonance circuit is the most important part for remote control, and determines the distance at which remote operation is possible. This distance can be varied greatly by adjusting L002.

(2) Signal amplifier

The signal amplifier consists of IC004 and the surrounding circuits. IC004 is a specific frequency amplifier, operating at the information propagation frequency of approx. 22 kHz with an amplification of about 100 dB. This frequency is determined by R004, R005, R006, C004, C005 and C006.

(3) System IC for reception

The system IC for reception is IC003 shown in Fig. 2.4.4. Terminal 1 of IC003 is supplied with a positive power source and Terminal 17 is grounded. IC003 has a built-in clock-generator. An additional circuit is connected to Terminals 2 and 3 in order to make a frequency identical to that of the transmitter. The frequency can be adjusted by L002. The information signal from the transmitter is amplified by the signal amplifier and input at Terminal 15 of IC003. It is processed by a read-in register, and an output corresponding to the input is produced through program portion. Since the program portion has 4 kinds of output (A, B, C and D), 16 ($2^4 = 16$) kinds of output are produced. Terminal 8 of IC003 is called the PC terminal and is H only when an information signal is input.

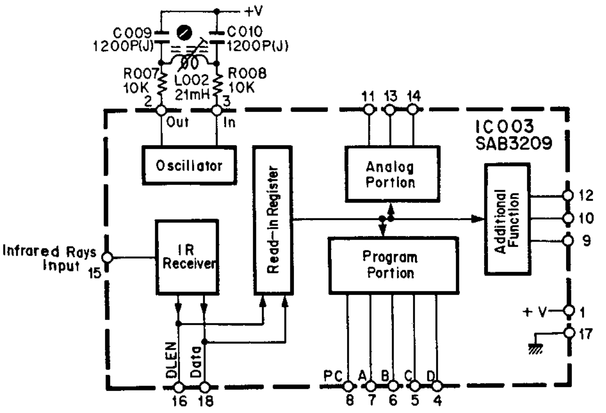


Fig. 2.4.4 Reception IC System Diagram

(4) Instantaneous power-disconnecting switch function

See Fig. 2.4.5 timing chart.

The instantaneous power-disconnecting switch function for the system IC for reception consists of Q002, Q003, IC001-1,2,3, -4,5,6 and their peripheral circuit IC003 maintains its state when an information signal is output from the program portion, until the next unit of information is input. However, since the maintenance of this state affects the functioning of N-581, the information stored in the program portion must be cleared when the remote control button is released, and it is for this reason that the switching function of instantaneous power-disconnecting is provided to disconnect the power supply to IC003 and to clear the memory.

When an infrared signal is input through Terminal 15 of IC003, signal as shown in the figure are produced at Terminal 8, and fed into the base of Q002, as a result Q002 is turned ON.

The output signal of Q002 is given to the base of Q003 through inverters IC001-4,5,6 and -1,2,3. Q003 controls the power supply to IC003. When Q003 is turned ON, +12 V will be supplied to IC003, but when turned OFF, +12 V will no longer be supplied.

When a unit of information is finished, Q002 will not be turned ON, as a result C012 will be kept charging.

When the voltage of C012 exceeds the threshold level of IC001-5,6 (approximately half of applied +12 V), IC001-4 will become L and IC001-3 will become H. This way, H level is applied to the base of Q303 through C013, as a result Q003 will be turned OFF momentarily to disconnect the power supply to IC003, so that the program stored in IC003 will become cleared.

(5) Information processor

The information processor of C-MOS ICs IC001-8,9,10, -11,12,13, IC002-1,2,3, -4,5,6, -8,9,10, -11,12,13, Q004, Q005 and their peripheral circuits. It processes the 4-bit output signals from IC003 input as infrared information signals.

The table of information transmitted and the corresponding 4-bit signals output from IC003 is as follows:

Information	Signal Bit			
	A(7)	B(6)	C(5)	D(4)
Play	L	H	L	H
Stop	L	H	H	L
Rewind	H	L	H	L
F.F.	H	H	L	L
Record	L	L	H	H
Pause	H	L	L	H

As shown in the above table, there are 6 kinds of information to be transmitted, and when power source and grounding are included, 8 bus lines are required. Each command will be output to Logic P.C.B. Ass'y of the N-581 as shown below:

(a) Play

When both IC002-5 (B) and -6 (D) are made H's, IC002-4 becomes L and D005 is turned ON, as a result $\overline{\text{Play}}$ = L signal is output and Play will be activated.

(b) Stop

When both IC002-12 (B) and -13 (C) are made H's, IC002-11 becomes L and D003 is turned ON, as a result $\overline{\text{Stop}}$ = L signal is output and Stop will be activated.

(c) Rewind

When both IC001-8 (A) and -9 (C) are made H's, IC001-10 becomes L and D007 is turned ON, as a result $\overline{\text{Rewind}}$ = L signal is output and Rewind will be activated.

(d) F.F. (Fast Forward)

When both IC002-1 (A) and -2 (B) are made H's, IC002-3 becomes L and D006 is turned ON, as a result $\overline{\text{F.F.}}$ = L signal is output and F.F. will be activated.

(e) Pause

When both IC002-8 (D) and -9 (A) are made H's, IC002-10 becomes L and D004 is turned ON, as a result $\overline{\text{Pause}}$ = L signal is output and Pause will be activated.

(f) Record

When both IC001-12 (C) and -13 (D) are made H's, IC001-11 becomes L, and Q004 is turned ON, and then Q005 is turned ON with a certain time delay through C015, as a result $\overline{\text{Record}}$ = L is output and Record will be activated.

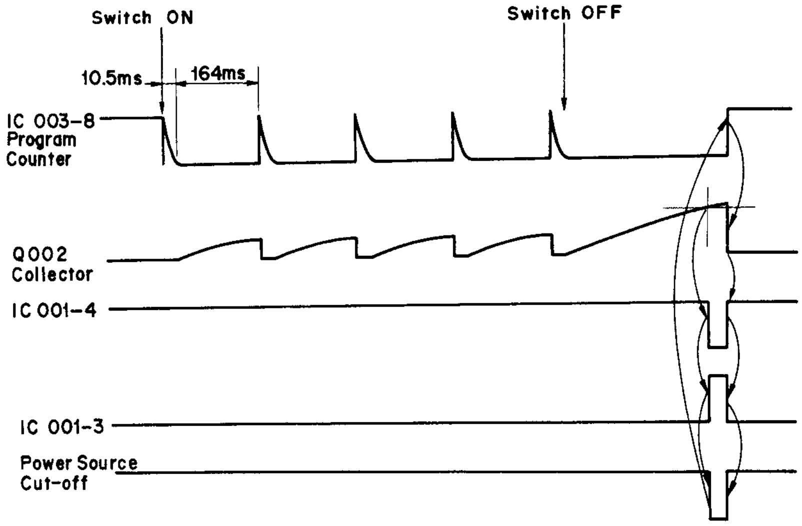


Fig. 2.4.5 Timing Chart

3. REMOVAL PROCEDURES

3.1. Acrylic Cassette Compartment Cover

Refer to Fig. 3.1.

(1) Push the Eject Button to open the Cassette Case Ass'y.

(2) Pull out F01 (Acrylic Cassette Compartment Cover) upwardly.

3.2. Top Cover Ass'y

Refer to Fig. 3.1.

Remove F02 and F03, then disassemble F04 (Top Cover Ass'y).

3.3. Bottom Cover Ass'y

Refer to Fig. 3.1.

Remove F05, then disassemble F06 (Bottom Cover Ass'y).

3.4. Front Panel Ass'y

Refer to Fig. 3.2.

(1) Refer to Fig. 3.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 3.2 and 3.3.

(2) Remove F01 (VR Knobs) by pushing with a screwdriver or similar tools from the inside of the N-581.

(3) Remove F02 (Switch Knobs) and F03, then disassemble F04 (Front Panel Ass'y including 2 connectors).

3.5. Mechanism Ass'y

Refer to Fig. 3.2.

(1) Remove Front Panel Ass'y referring to item 3.4.

(2) Remove F05, then disassemble F06 (Headphone Jack Ass'y).

(3) Remove F07, then disassemble F08 (Mechanism Ass'y including 4 connectors).

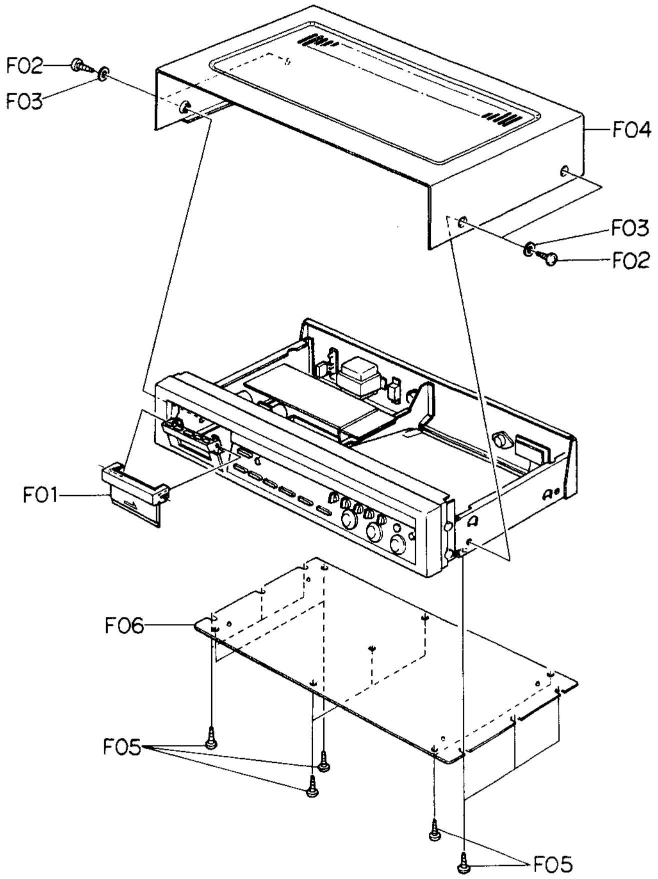


Fig. 3.1

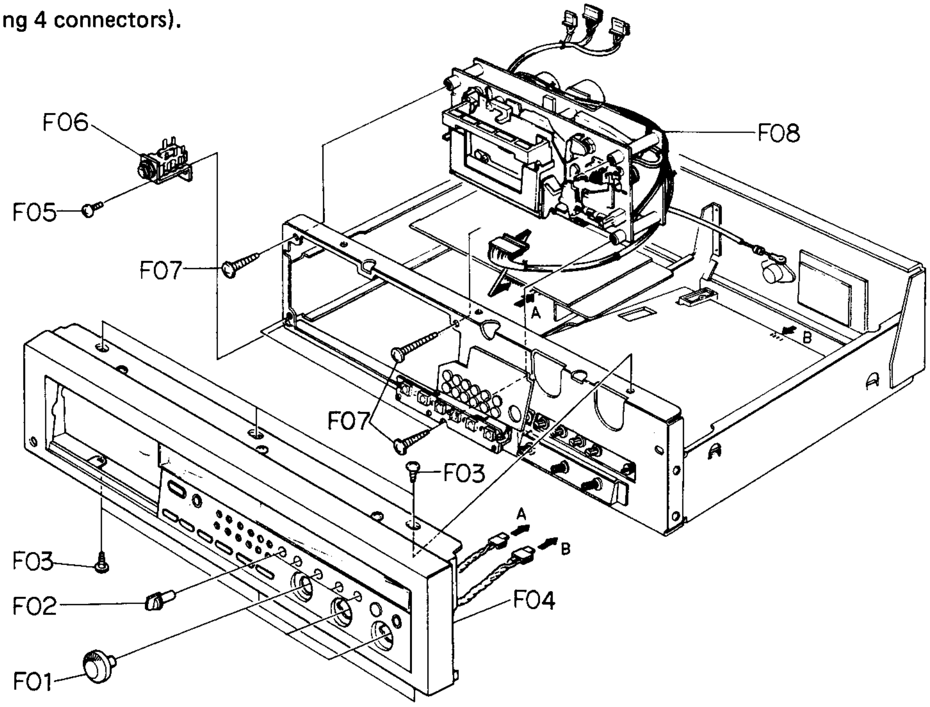


Fig. 3.2

3.6. Main P.C.B. Ass'y

Refer to Fig. 3.3.

(1) Refer to Fig. 3.2. Remove Front Panel Ass'y referring to item 3.4.

(2) Remove the flat cable, connectors and wires connected by wrapping from F04 (Main P.C.B. Ass'y).

(3) Remove F01, F02, F03 and the Record Linkage Wire from the Wire Holder assembled with Record Switch, then disassemble F04 (Main P.C.B. Ass'y).

3.7. Logic P.C.B. Ass'y

Refer to Fig. 3.3.

(1) Refer to Fig. 3.2. Remove Front Panel Ass'y referring to item 3.4.

(2) Remove the connectors and wires connected by wrapping from F06 (Logic P.C.B. Ass'y).

(3) Remove F05, then disassemble F06 (Logic P.C.B. Ass'y).

3.8. Power Switch

Refer to Fig. 3.3.

(1) Remove Main P.C.B. Ass'y referring to item 3.6.

(2) Remove F07 and F08, then disassemble F09 (Power Switch).

3.9. Volume P.C.B. Ass'y

Refer to Fig. 3.3.

(1) Refer to Fig. 3.2. Remove Front Panel Ass'y referring to item 3.4.

(2) Remove F10, then disassemble F11 (Volume P.C.B. Ass'y).

3.10. Control Button Ass'y

Refer to Fig. 3.3.

(1) Refer to Fig. 3.2. Remove Front Panel Ass'y referring to item 3.4.

(2) Remove F12, then disassemble F13 (Control Button Ass'y).

3.11. Record Cal. P.C.B. Ass'y

Refer to Fig. 3.3.

(1) Refer to Fig. 3.2. Remove Front Panel Ass'y referring to item 3.4.

(2) Remove F14, then disassemble F15 (Record Cal. P.C.B. Ass'y).

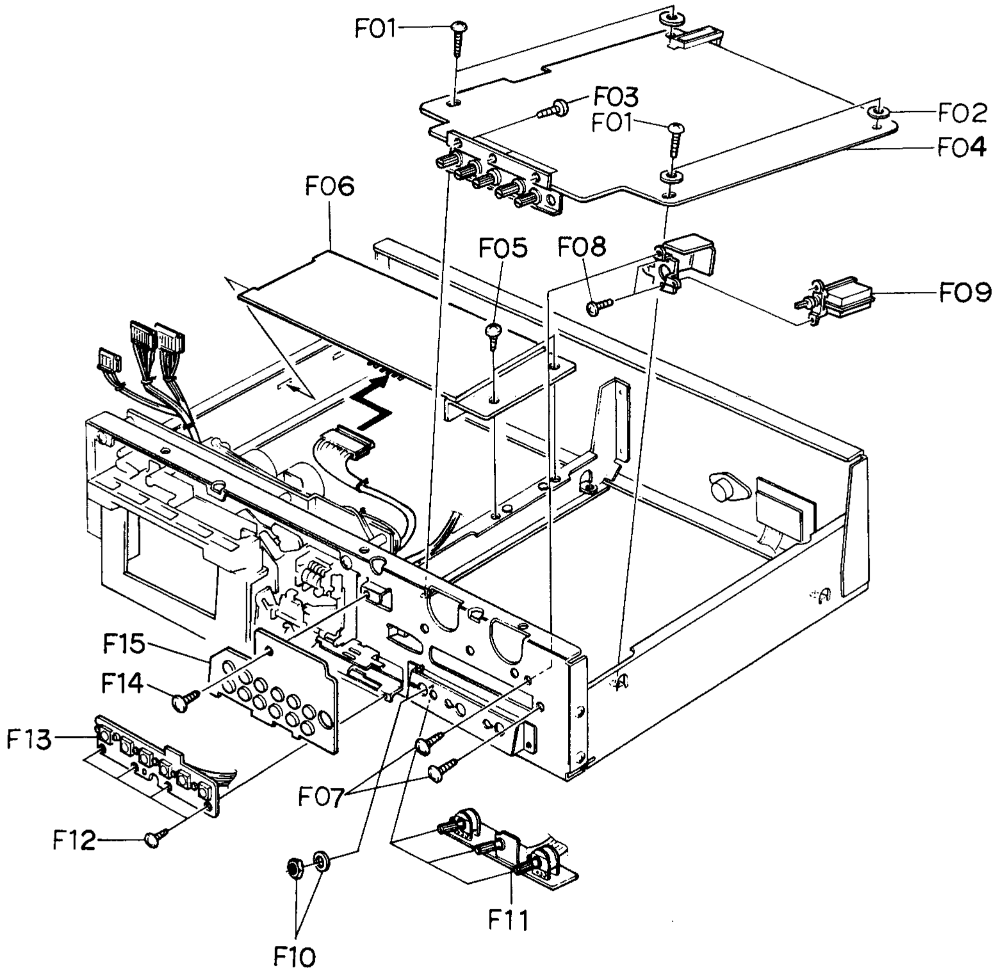


Fig. 3.3

3.12. Meter Ass'y

Refer to Fig. 3.4.

(1) Refer to Fig. 3.2. Remove Front Panel Ass'y referring to item 3.4.

(2) Remove F01 and F02, then disassemble F03 (Meter Ass'y).

3.13. Lamp P.C.B. Ass'y

Refer to Fig. 3.4.

(1) Remove Meter Ass'y referring to item 3.12.

(2) Remove F04, then disassemble F05 (Lamp House Cover Ass'y).

(3) Remove F06, then disassemble F07 (Lamp. P.C.B. Ass'y).

3.14. Aluminum Mirror

Refer to Fig. 3.4.

(1) Remove Lamp House Cover Ass'y referring to item 3.13.

(2) Remove F08, then disassemble F09 (Aluminum Mirror).

3.15. Rear Panel Ass'y

Refer to Fig. 3.5.

(1) Refer to Fig. 3.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 3.2 and 3.3.

(2) Remove F01, F02 and F03, then disassemble F04 (Rear Panel Ass'y).

3.16. Power Transformer

Refer to Fig. 3.5.

(1) Refer to Fig. 3.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 3.2 and 3.3.

(2) Remove F05, F06 and F07, then disassemble F08 (Power Transformer).

3.17. Cassette Case Ass'y

Refer to Fig. 3.6.

(1) Refer to Fig. 3.2. Remove Mechanism Ass'y referring to item 3.5.

(2) Push the Eject Button to open the Cassette Case Ass'y.

(3) Remove F01, then disassemble the piston of the Air Damper Ass'y.

(4) Remove F02 and F03, then disassemble F04 (Cassette Case Ass'y).

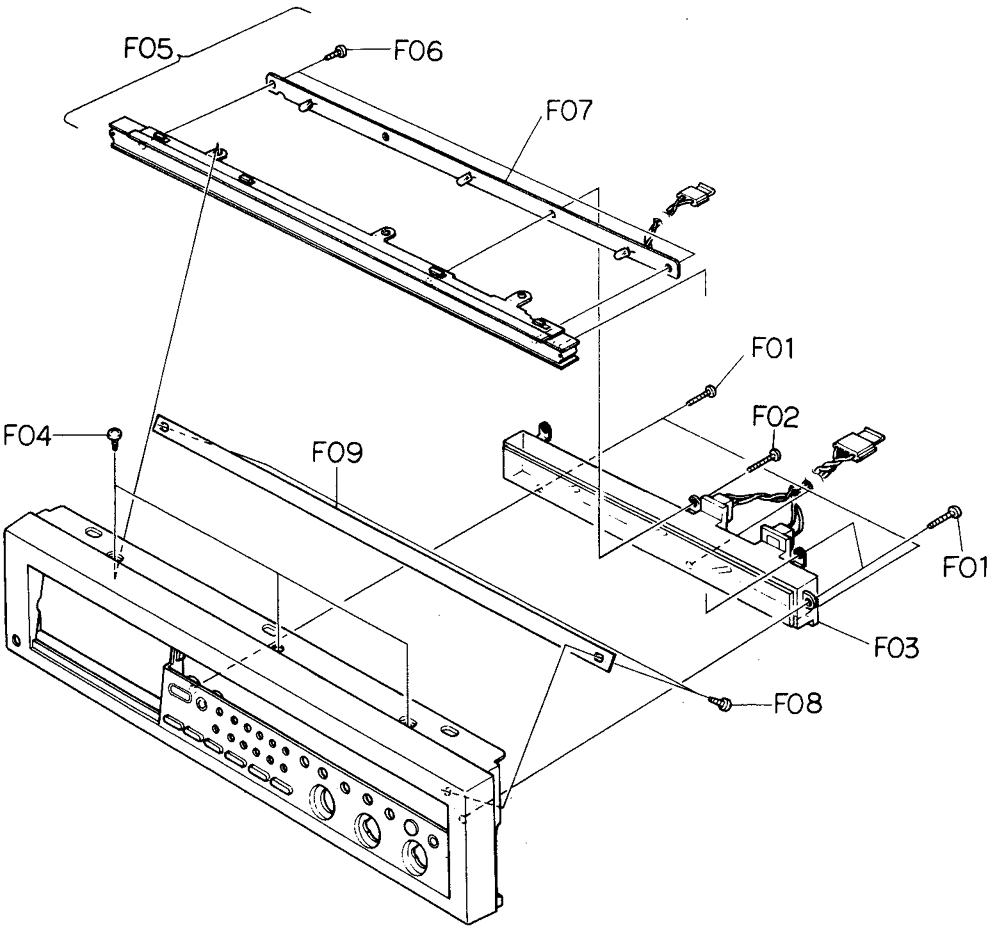


Fig. 3.4

3.18. Cover Plate

Refer to Fig. 3.6.

(1) Refer to Fig. 3.2. Remove Front Panel Ass'y referring to item 3.4.

(2) Push the Eject Button to open the Cassette Case Ass'y.

(3) Remove F05, then disassemble F06 (Cover Plate).

3.19. Tape Counter Ass'y

Refer to Fig. 3.6.

(1) Refer to Fig. 3.2. Remove Front Panel Ass'y referring to item 3.4.

(2) Remove F07, then disassemble F08 (Tape Counter Ass'y).

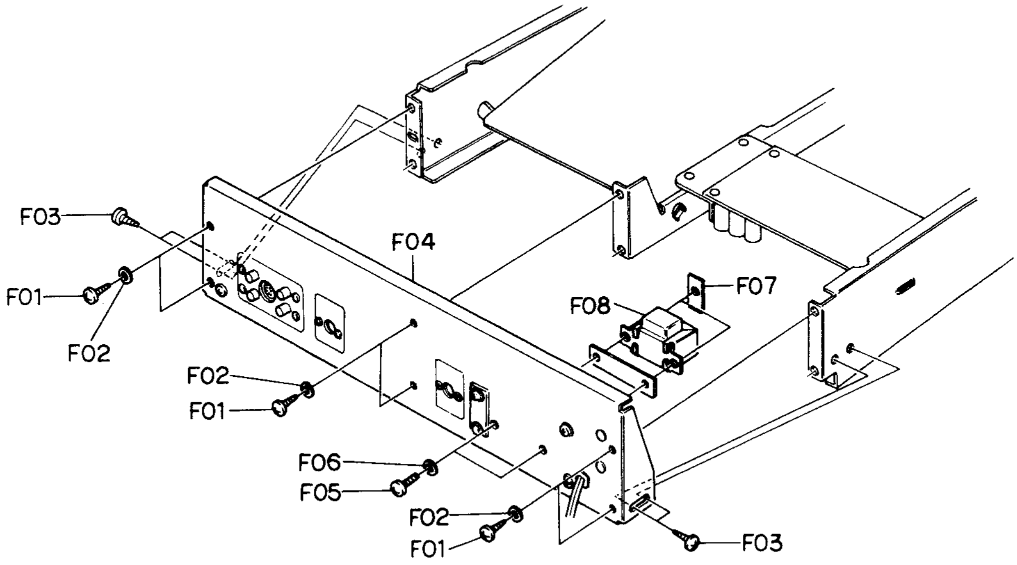

F03
F01
F02
F04
F08
F07
F02
F01
F06
F05
F02
F01
F03

Fig. 3.5

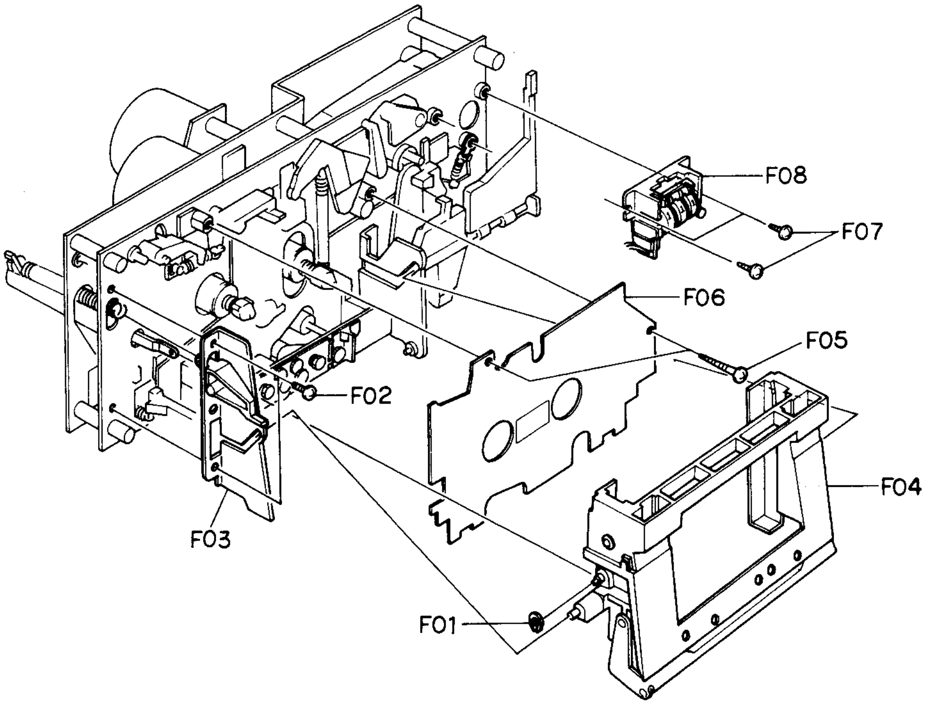

F08
F07
F06
F05
F02
F04
F03
F01

Fig. 3.6

3.20. Capstan Motor Ass'y and Flywheel Ass'y

Refer to Fig. 3.7.

(1) Refer to Fig. 3.2. Remove Mechanism Ass'y reffering to item 3.5.

(2) Remove F01 and F02, then disassemble F03 (Flywheel Holder Ass'y) and F06 (Capstan Belt).

(3) Remove F04, then disassemble F05 (Capstan Motor Ass'y).

(4) Remove F07 (Supply Flywheel Ass'y), then disassemble F08 (Take-up Flywheel Ass'y).

(5) After removing both Flywheel Assemblies, disassemble F09 (Thrust Washer 3.1 mm), F10 (Thrust Washer 2.6 mm), F11 (Flange Thrust Caps) and F12 (Flywheel Thrust Springs).

3.21. Sub Mechanism Chassis Ass'y

Refer to Fig. 3.8.

(1) Refer to Fig. 3.2. Remove Mechanism Ass'y referring to item 3.5.

(2) Remove Flywheel Holder Ass'y and both Flywheel Assemblies referring to above item 3.20.

(3) Remove F01 and F02, then disassemble F03 (Sub Mechanism Chassis Ass'y).

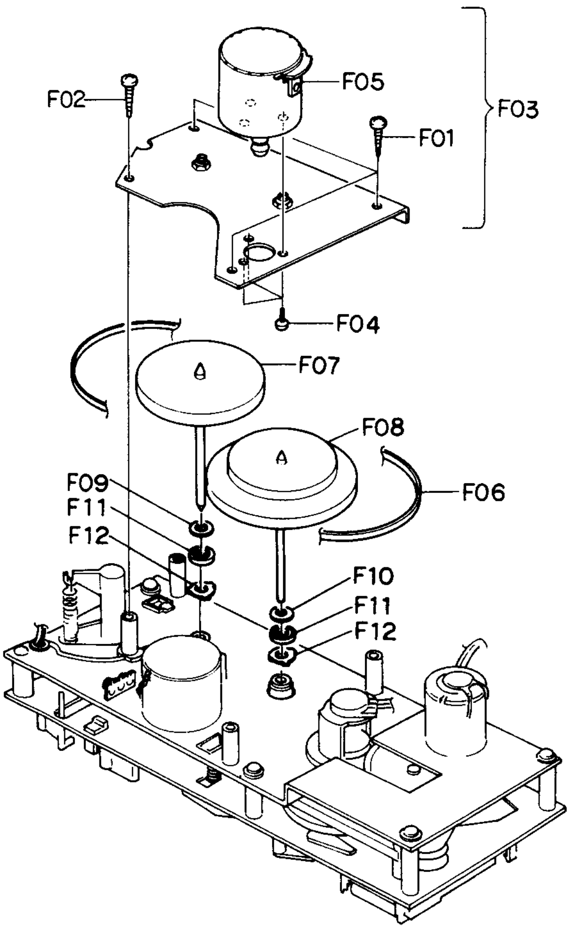


Fig. 3.7

3.22. Control Motor Ass'y

Refer to Fig. 3.8.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 3.21.

(2) Remove F04, then disassemble F05 (Control Motor Ass'y).

3.23. Reel Motor Ass'y

Refer to Fig. 3.8.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 3.21.

(2) Remove F06, then disassemble F07 (Reel Motor Ass'y).

3.24. Cam Control Volume

Refer to Fig. 3.8.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 3.21.

(2) Remove F08, then disassemble F09 (Volume Coupler).

(3) Remove F10, then disassemble F11 (Cam Control Volume).

3.25. Reel Hub Ass'y

Refer to Fig. 3.8.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 3.21.

(2) Remove F12 (Reel Hub Heads).

(3) Remove F13 (Reel Hub B Assemblies)

(4) Remove F14 (Reel Hub Take-up Ass'y) and F15 (Reel Hub Supply Ass'y).

(5) Remove F16 (Back Tension Felt) and F17 (BackTension Spring) from the supply side Reel Hub Ass'y.

3.26. Idler Ass'y

Refer to Fig. 3.8.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 3.21.

(2) Remove F18, then disassemble F19 (Idler Ass'y).

3.27. Cam Drive Gear and Cam

Refer to Fig. 3.8.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 3.21.

(2) Remove F20, then disassemble F21 (Cam Drive Gear).

(3) Remove F22, then disassemble F23 (Counter-Load Arm Ass'y).

(4) Remove F24, then disassemble F25 (Cam).

3.28. Head Mount Base Ass'y

Refer to Fig. 3.9.

(1) Refer to Fig. 3.6. Remove Cassette Case Ass'y referring to item 3.17.

(2) Remove F01, then disassemble F02 (Head Mount Base Ass'y).

3.29. Supply Pressure Roller Ass'y

Refer to Fig. 3.9.

(1) Remove Head Mount Base Ass'y referring to item 3.28.

(2) Remove F03 and a washer, then disassemble F04 (Supply Pressure Roller Ass'y).

3.30. Erase Head

Refer to Fig. 3.9.

(1) Remove Head Mount Base Ass'y referring to item 3.28.

(2) Remove F05, then disassemble F06 (Erase Head).

3.31. Take-up Pressure Roller Ass'y

Refer to Fig. 3.9.

(1) Remove Head Mount Base Ass'y referring to item 3.28.

(2) Remove F07 and a washer, then F08 (Take-up Pressure Roller Ass'y).

3.32. Playback Head Ass'y

Refer to Fig. 3.9.

(1) Remove Head Mount Base Ass'y referring to item 3.28.

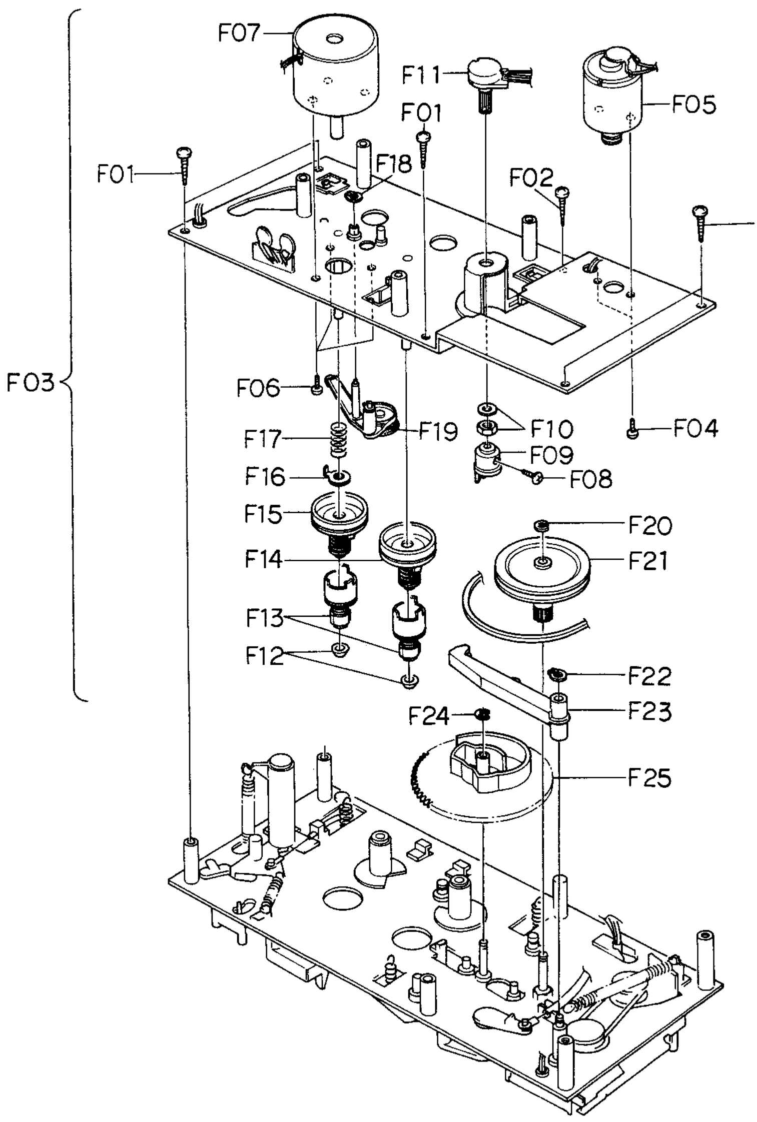
(2) Turn F09 by 90° by pushing it, then disassemble F10 (Playback Head Ass'y).

3.33. Record Head Ass'y

Refer to Fig. 3.9.

(1) Remove Head Mount Base Ass'y referring to item 3.28.

(2) Turn F11 by 90° by pushing it, then disassemble F12 (Record Head Ass'y).


F07
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F12
F22
F24
F23
F25

Fig. 3.8

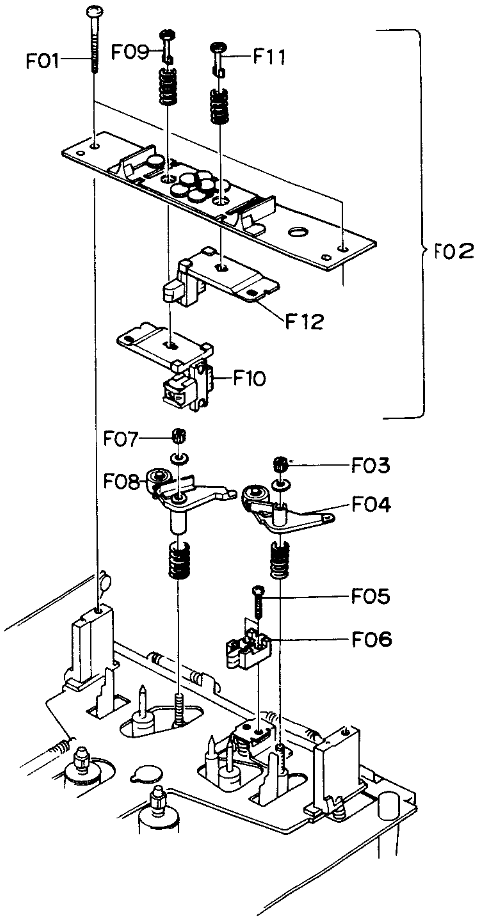

F01
F09
F11
F02
F12
F10
F07
F03
F08
F04
F05
F06

Fig. 3.9

4. MEASUREMENT INSTRUMENTS

(1) Audio Generator (20 Hz – 200 kHz)
(2) AC Milivolt Meter (with dB measures)
(3) Oscilloscope (DC – 5 MHz)
(4) Distortion Meter
(5) Speed & Wow/Flutter Meter
(6) Frequency Counter (DC – 1 MHz)
(7) Ohm Meter
(8) DC Volt Meter
(9) AC Volt Meter
(10) Torque Gauge (DA09013A)
(11) 15 kHz Azimuth Tape (DA09004A)
(12) 3 kHz Speed & Wow/Flutter Tape (DA09006A)
(13) 1 kHz Track Alignment Tape (DA09007A)
(14) 400Hz Level Tape (DA09005A)
(15) 20 kHz PB Frequency Response Tape (DA09001A)
(16) 15 kHz PB Frequency Response Tape (DA09002A)
(17) 10 kHz PB Frequency Response Tape (DA09003A)
(18) Reference EXII Tape (DA09021A)
(19) Reference SX Tape (DA09025A)
(20) Tilt Check Gauge M-9039 (DA09039A)
(21) EH Tilt Check Gauge M-9040 (DA09040A)
(22) EH Stroke Check Gauge M-9042 (DA09042A)
(23) Stroke Check Gauge M-9047 (DA09047A)
(24) Record Head Mounting Gauge M-9048 (DA09048A)
(25) Audio Analyzer T-100
(including Distortion, Wow/Flutter, Speed, Oscillator and dB meter)

Note: (10) – (25) are the products of Nakamichi Corporation.

5. MECHANICAL ADJUSTMENTS

5.1. Mechanism Control Cam Adjustment

Before adjustment, disassemble the Front Panel Ass'y then remove the Cover Plate, referring to items 3.4 and 3.18.

(1) Offset Adjustment of Control Motor Driver

(a) Refer to Figs. 5.1 and 5.2.
Adjust VR402 and VR401 on the Logic P.C.B. to locate approximately at the middle of the variable range. Then turn ON the Power Switch.
VR402 (for Cam position stop)
VR401 (for Cam position play)

(b) Press the Stop Switch to set the N-581 in stop mode.
Adjust VR402 (for stop) so that the "S" mark on the Cam corresponds to the pointer on the mechanism chassis.

(c) Press the Play Switch to set the N-581 in playback mode.
(Cam will rotate, and the position marked with "PY" comes to the pointer.)
Adjust VR401 (for play) so that the "PY" mark on the Cam corresponds to the pointer.

(d) Repeat above (b) and (c) 2 – 3 times so that the "S" and "PY" marks on the cam correspond to pointer accurately in stop and playback modes respectively. (This adjustment is required because the position adjusted by one volume will be slightly changed when the other volume is adjusted.)

(e) Set the N-581 in FF, pause, record, or cue mode by pressing each switch (press FF and Pause Switches to set the N-581 in cue mode) and check to insure that the pointer is in a range of "F", "PS", "R", or "CU" mark respectively.

(f) If out of the range, precise adjustment for each position according to "(2) Offset Fine Adjustment of Control Motor Driver" will be required.

(2) Offset Fine Adjustment of Control Motor Driver

Adjust only if a satisfactory result is not obtained in "(1) Offset Adjustment of Control Motor Driver".

This adjustment is made by changing the value of the fixed resistors on the Logic P.C.B. Voltages below shown are typical value.

(a) Observation Point of Reference Voltage

Observe the each voltage at the sliding contact of the Cam Control Volume VR601 (10 kΩ) in stop, fast (FF or REW), pause, record and playback modes.

Note: When Record and Play Switches are pressed to set N-581 in record mode, the Cam is first set to the record position in a short period of time then stays at the play position.
Therefore, to keep the Cam at the record position, following procedure is required:
Short the both leads of capacitor C426 (4.7 µF 25 V) on the Logic P.C.B. with a jumper wire, then press the Record and Play Switches.

(b) Reference Voltage

Reference voltage at the sliding contact of VR601 (Cam Control Volume) in each mode is as follows:

Mode	Reference Voltage (Typical Value)	
Record	4.1 V	1.1 V $^{+0.4}_{-0.2}$ V
Stop	3.0 V	1.7 V ±0.25 V
Fast (FF/REW)	1.3 V	
Pause	–2.8 V	2.6 V ±0.4 V
Playback	–5.4 V	

(c) Resistors for Adjustment

Mode	Ref. No.	Typical Value
Stop	R501	9.1 kΩ (F)
Fast (FF/REW)	R507	4.32 kΩ (F)
Pause	R514	287 kΩ (F)
Playback	R511	174 kΩ (F)
Record	R499	27 kΩ

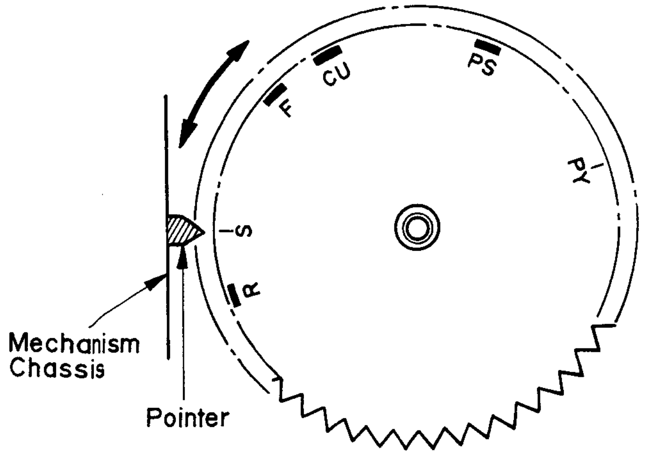


Fig. 5.1

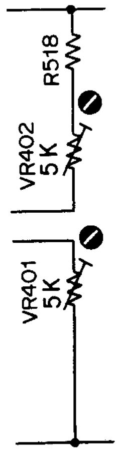


Fig. 5.2

(d) Adjustment Procedures

1) Press the Stop Switch to set the N-581 in stop mode. Adjust the value of R501 to obtain 3.0 V (±0.6 V) at the sliding contact of VR601.

   Note: When R501 is adjusted, the reference voltage in fast (FF or REW) mode is changed. Therefore, re-check of the reference voltage in fast (FF or REW) mode is required.

   If the reference voltage is out of the range, re-adjustment of R507 according to next step 2) is necessary.

2) Set the N-581 in FF mode, then adjust the value of R507 so that the voltage of VR601 will become lower by 1.7 V (±0.25 V) than in stop mode.

3) Press the Pause Switch to set the N-581 in pause mode.

   Adjust the value of R514 to obtain −2.8 V (+0.4, -0.15 V) at the sliding contact of VR601.

4) Set the N-581 in playback mode, then adjust the value of R511 so that the voltage of VR601 will become lower by 2.6 V (±0.4 V) than in pause mode.

5) Short the both leads of capacitor C426 with a jumper wire.

   Set the N-581 in record mode, then adjust the value of R499 so that the voltage of VR601 will become higher by 1.1 V (+0.4, -0.2V) than in stop mode.

   Note: Remove the short of C426 after completion of adjustment.

(3) Cam Timing Adjustment

(a) Remove the wires from the Control Motor Terminals to set the motor open.

(b) Without loading a cassette tape and with pressing the Record Protecting Switch with your fingers, press the Record and Play Switches to set the N-581 in record mode.

(c) Turn the Cam and bring the "PY" mark toward the pointer by hand.

Reel Motor will rotate before the "PY" mark reaches the pointer.

Adjust the value of R488 so that the voltage at sliding contact of VR601 becomes -3.6 V(±0.3 V) when Reel Motor starts rotation.

(d) Observe the mute signal at the Q424 collector. Turn the Cam referring to above step (c) and check to insure that the voltage at the sliding contact of VR601 is -3.8 V (±0.3 V) when mute is released (mute signal changes from H to L).

(This voltage is determined by the adjustment of R488 in above step (c).)

(e) Observe the $\overline{\text{Rec.}}$ signal at the Q421 collector. Turn the Cam referring to above step (c) and adjust the value of R480 to obtain -2.1 V (±0.4 V) at the sliding contact of VR601 when $\overline{\text{Rec.}}$ signal changes from H to L (bias oscillation will begin).

(f) Upon completion of above adjustment, re-connect wires to the motor terminals.

5.2. Tape Speed Adjustment

(1) Remove the Top Cover.

(2) Connect a Frequency Counter to the Output Jack.

(3) Load a 3 kHz Speed Wow/Flutter Tape (DA09006A) and play it back.

(4) Referring to Fig. 5.3, adjust the Tape Speed Adjustment Volume (VR501) incorporated in the Capstan Motor to obtain 3,000 Hz on the Frequency counter.

CCW: Motor drives slowly.
CW: Motor drives fast.

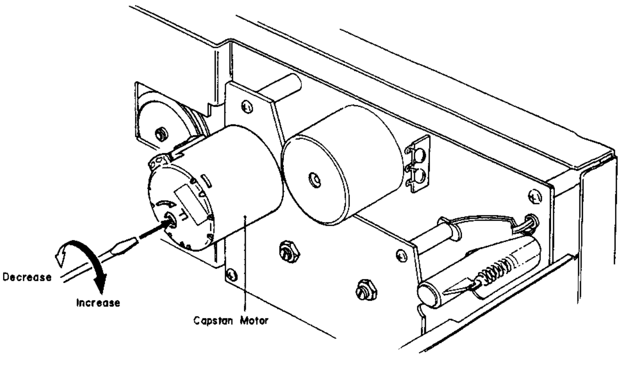


Fig. 5.3

5.3. Record Head and Playback Head Tilt Adjustment

Note: On items 5.3 – 5.8, please refer to Fig. 5.4 flow chart.

Refer to Figs. 5.5 and 5.6.

(1) Load a Tilt Check Gauge M-9039 (DA09039A) in the N-581.

(2) Clip the grounding terminal of the Tilt Check Gauge with one end of the cord with clip, and the other end to the chassis of the N-581.

(3) Remove both of the Height Gears.

(4) Set the N-581 in play mode. Check to insure wheather the Beacons Playback Head "Upper" or "Lower" and Record Head "Upper" or "Lower" are illuminating. In order not to give damages onto the head surfaces, push both of slide knobs of the Gauge to the direction of arrow marks, then return it to the original place to be in contact with record head and playback head surfaces after play mode is securely locked.

(5) Check to insure freedom from contact between the Gauge and pad lifter.

(6) Beacon Playback Head "Lower" will light on when height adjustment screw (P) turned clockwise but Playback Head "Upper" when counterclockwise. Adjust so that both "Upper" and "Lower" will light on even when you move the slide knob to the direction of an arrow mark and then return it to the original place.

(7) Same procedures will apply to the Beacons Record Head "Upper" and "Lower", except for the height adjustment screw (R).

(8) Set the N-581 in stop mode and fit both of the serrated height gears. Then set the N-581 again in play mode and insure all of the 4 Beacons are illuminating. If not, (3) through (7) will have to be repeated till satisfactory results are obtained.

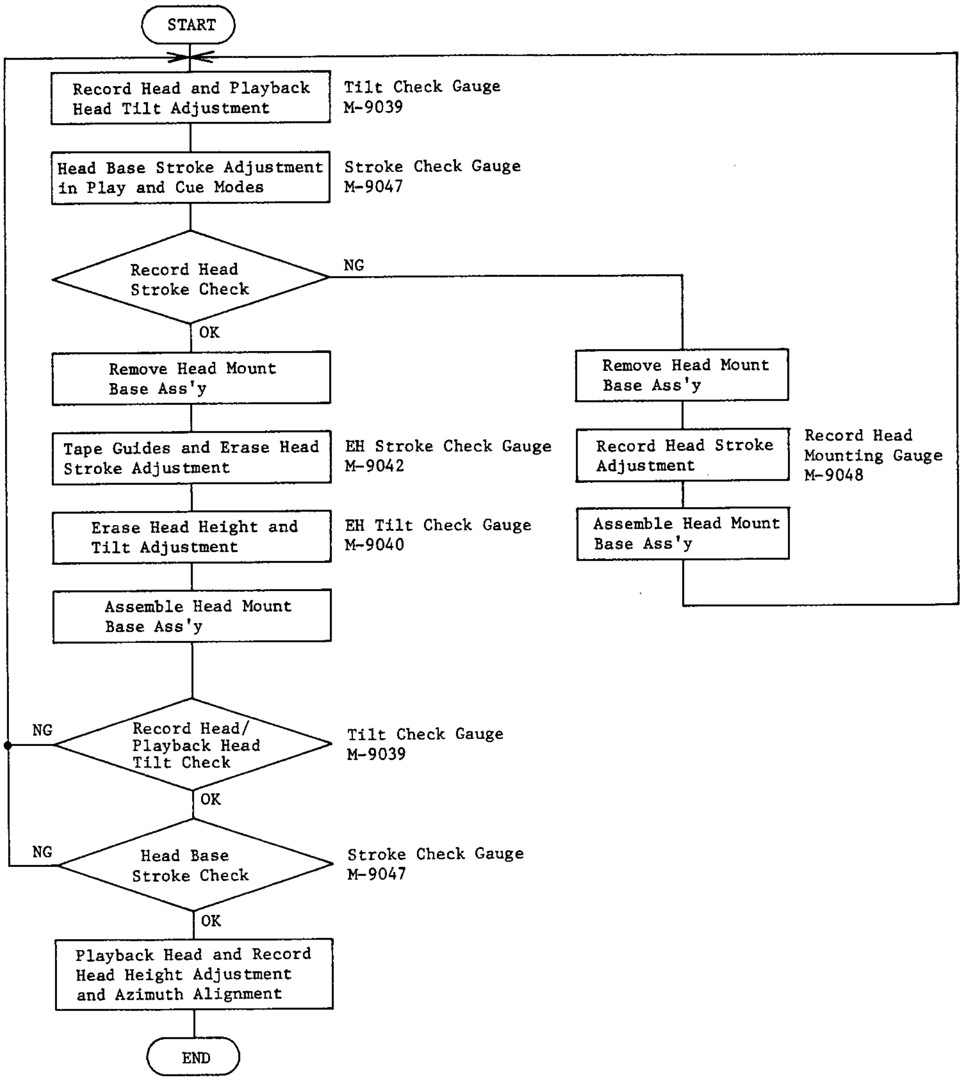

START
Record Head and Playback Head Tilt Adjustment
Tilt Check Gauge M-9039
Head Base Stroke Adjustment in Play and Cue Modes
Stroke Check Gauge M-9047
Record Head Stroke Check
NG
OK
Remove Head Mount Base Ass'y
Tape Guides and Erase Head Stroke Adjustment
EH Stroke Check Gauge M-9042
Erase Head Height and Tilt Adjustment
EH Tilt Check Gauge M-9040
Assemble Head Mount Base Ass'y
Remove Head Mount Base Ass'y
Record Head Stroke Adjustment
Record Head Mounting Gauge M-9048
Assemble Head Mount Base Ass'y
NG
Record Head/ Playback Head Tilt Check
Tilt Check Gauge M-9039
OK
NG
Head Base Stroke Check
Stroke Check Gauge M-9047
OK
Playback Head and Record Head Height Adjustment and Azimuth Alignment
END

Fig. 5.4 Adjustment Flow Chart

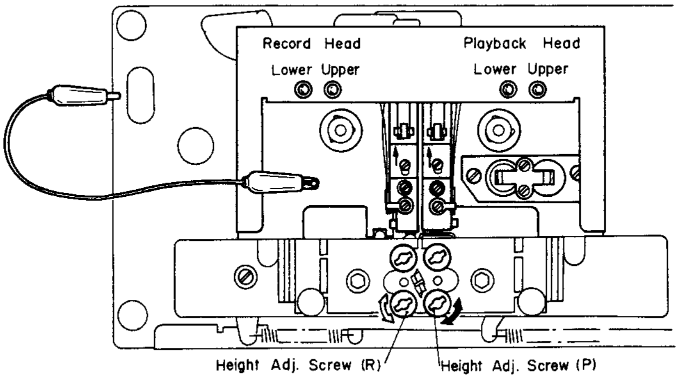

Record Head
Lower Upper
Playback Head
Lower Upper
Height Adj. Screw (R)
Height Adj. Screw (P)

Fig. 5.5

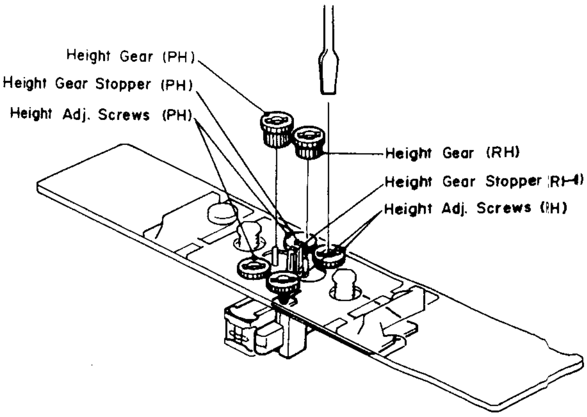

Height Gear (PH)
Height Gear Stopper (PH)
Height Adj. Screws (PH)
Height Gear (RH)
Height Gear Stopper (RH)
Height Adj. Screws (RH)

Fig. 5.6

5.4. Head Base Stroke Adjustment in Play and Cue Modes

Note: Before you conduct this adjustment, adjust with a "Tilt Check Gauge" to insure freedom from tilt on the playback head and record head.

(1) Head Base Stroke Adjustment in Play Mode

Refer to Fig. 5.7.

(a) Load a Stroke Check Gauge M-9047 (DA09047A) in the N-581.

(b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the N-581 in play mode.
Then slowly release the Indicators and insure wheather each of the Indicators is in contact with record and playback heads.

(c) Check to insure wheather the "P" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.

(d) If the playback head stroke is noted to be misaligned, adjustment can be made by moving the stroke adjuter assembled in the head base assembly (either forwardly or backwardly).

(e) Check to insure wheather the "P" pointer on the Playback Head Indicator locates between the 2 lines on the Record Head Indicator, thus check can be made on record head stroke.

(f) If the record head stroke is noted to be misaligned, adjustment can be made with a Record Head Mounting Gauge M-9048 (DA09048A).

(2) Head Base Stroke Adjustment in Cue Mode

Refer to Fig. 5.8.

(a) Load a Stroke Check Gauge M-9047 (DA09047A) in the N-581.

(b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the N-581 in cue mode (F.F. and Pause).
Then slowly release the Indicators and insure wheather each of the Indicators is in contact with record and playback heads.

(c) Check to insure wheather the "C" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.

(d) If the playback head stroke is noted to be misaligned, adjust VR403 of the Logic P.C.B. Ass'y till satisfactory results are obtained.

(e) After completion of the Head Base Stroke Adjustment, check to insure accuracy of the Head Base Stroke Adjustment in play mode.
If the above are inaccurate, items (1) and (2) will have to be repeated till satisfactory results are obtained.

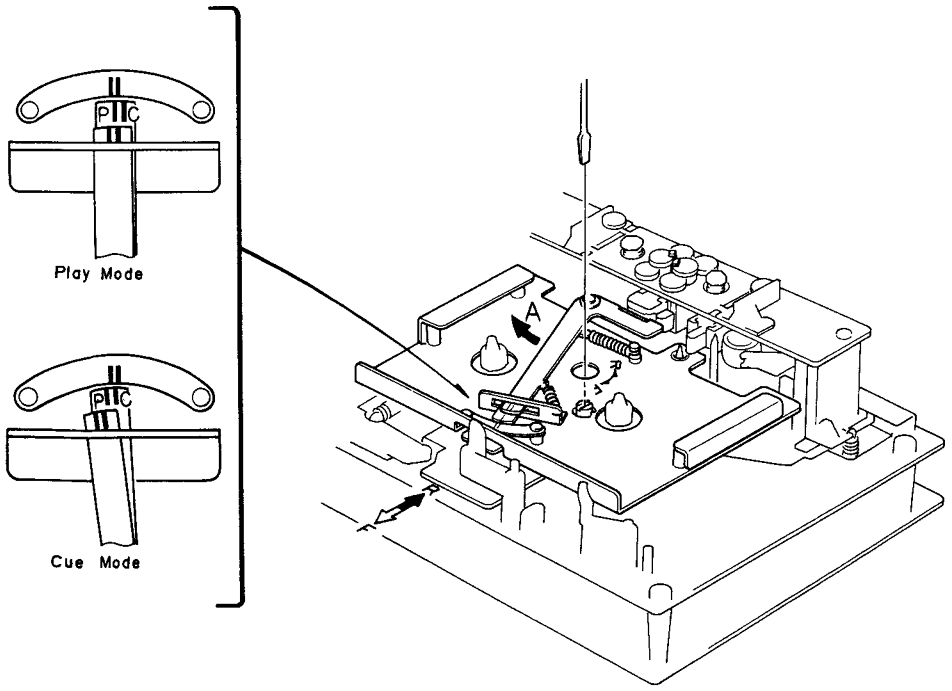


Fig. 5.7

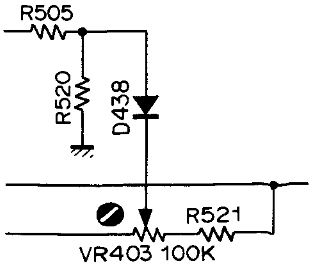


Fig. 5.8

5.5. Tape Guides Adjustment and Erase Head Stroke Adjustment

Remove Head Mount Base Ass'y referring to item 3.28. Refer to Figs. 5.9 and 5.10.

(1) Supply Tape Guide Height Adjustment

(a) Load an EH Stroke Check Gauge M-9042 (DA09042A) in the N-581.

(b) Set the N-581 in play mode.

(c) Slide the Supply Tape Guide Check Bar down against the supply tape guide, thus check can be made on supply tape guide height.

(d) If the supply tape guide is misaligned, the Supply Tape Guide Check Bar will not come into the supply tape guide. If such is noted, turn to adjust the height adjustment nut A till the Supply Tape Guide Check Bar is accepted by the supply tape guide.

(e) If the above are insured, set the N-581 in pause mode, then in play mode to see wheather adjustments are appropriately made. If not,(b) through (e) will have to be repeated till satisfactory results are obtained.

(2) Take-up Tape Guide Height Adjustment

(a) Load an EH Stroke Check Gauge M-9042 (DA09042A) in the N-581.

(b) Set the N-581 in play mode.

(c) Slide the Take-up Tape Guide Check Bar down against the take-up tape guide, thus check can be made on take-up tape guide height.

(d) If the take-up tape guide is misaligned, the Take-up Tape Guide Check Bar will not come into the take-up tape guide. If such is noted, turn to adjust the height adjustment nut B till the Take-up Tape Guide Check Bar is accepted by the take-up tape guide.

(e) If the above are insured, set the N-581 in pause mode, then in play mode to see wheather adjustments are appropriately made. If not, (b) through (e) will have to be repeated till satisfactory results are obtained.

(3) Erase Head Stroke Adjustment

(a) Load an EH Stroke Check Gauge M-9042 (DA09042A) in the N-581.

(b) Set the N-581 in play mode, thus check can be made on erase head stroke through the EH Stroke Indicator.

(c) Check to insure wheather the erase head surface is aligned with red line on the EH Stroke Indicator. If not, adjust the erase head stroke by loosening 2 screws that assembled erase head and erase head plate.

(d) After completion of adjustment, 2 pcs. of screws shall be locked with lock tight paint.

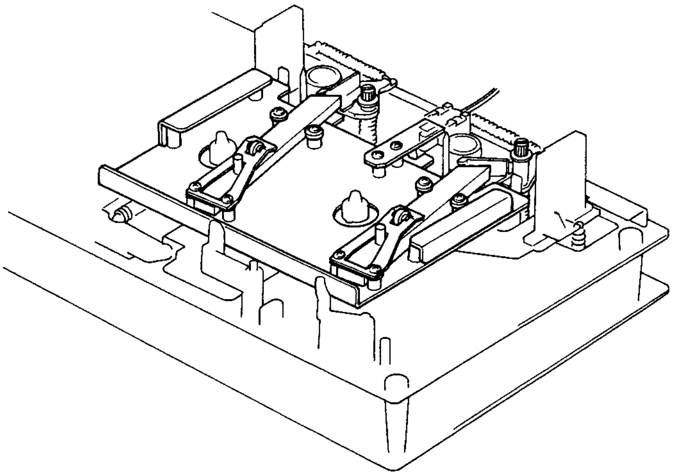


Fig. 5.9

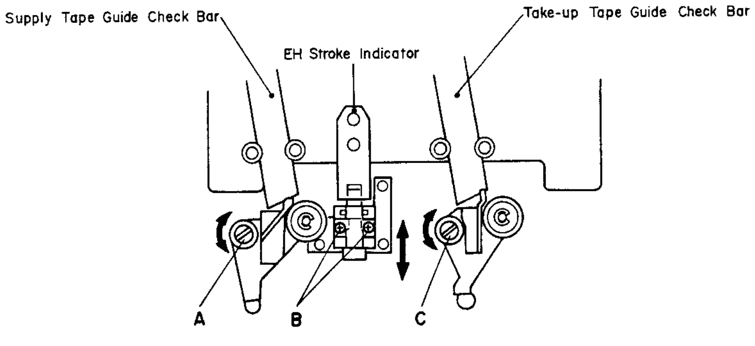


Fig. 5.10

5.6. Erase Head Height and Tilt Adjustment

Refer to Figs. 5.11 and 5.12.

(1) Remove Head Mount Base Ass'y referring to item 3.28.

(2) Load an EH Tilt Check Gauge M-9040 (DA09040A) in the N-581.

(3) Set the N-581 in stop mode.

(4) Check to insure wheather one of the 3 Beacons is illuminating. Look down the mirror as shown by an arrow mark and slowly turn the Screw "Height" counterclockwise (or clockwise) so that the two horizontal lines of the mirror will become superposed on the line (in different color) of the erase head, and check to insure wheather Beacon "1" is illuminating.

(5) Turn Screw "Tilt" counterclockwise (or clockwise) to light on Beacon "2". Excessive turning will cause the Beacon "1" to light off. Adjustments of Screw "Tilt" will therefore be conducted till both of the Beacons "1" and "2" illuminate.

(6) Turn Screw "Azimuth" counterclockwise (or clockwise) to light on Beacon "3". Excessive turning will cause either Beacon "1" or "2" to light off, and therefore adjust with Screw "Azimuth" until all of the 3 Beacons, "1", "2" and "3" illuminate.

(7) Check to insure wheather the horizontal line on the mirror corresponds to that on the erase head. If not, (4) through (7) will have to be repeated till satisfactory results are obtained.

(8) After completion of adjustment, 3 pcs. of screws shall be locked with lock tight paint.

Note: Before use of this gauge, check to insure freedom from dust or dirts, or overflow in the groove of the erase head surface.

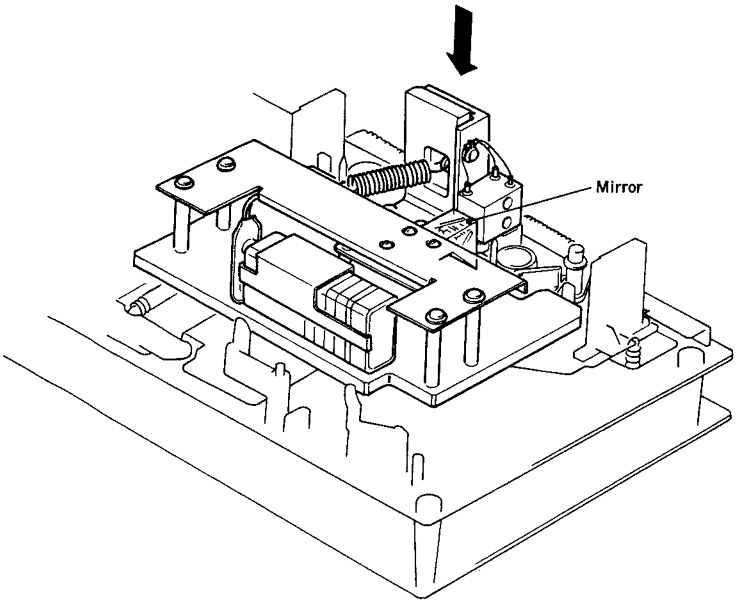


Fig. 5.11

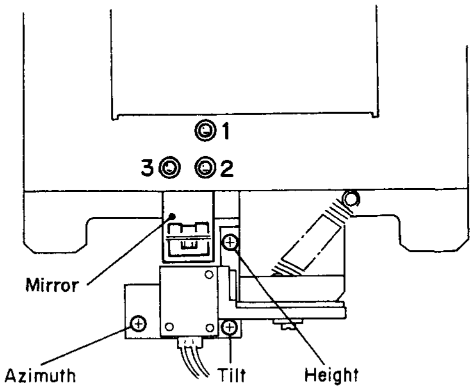


Fig. 5.12

5.7. Playback Head and Record Head Height Adjustment and Azimuth Alignment

Refer to Fig. 5.13.

(1) Playback Head Height Adjustment and Azimuth Alignment

(a) Place the Monitor Switch in the Tape position, then connect VTVM to the Output Jacks.

(b) Load a 1 kHz Track Alignment Tape (DA09007A), then set the N-581 in play mode.

(c) Turn the PH Height Gear until the output of both channels becomes minimum.

(d) Load a 15 kHz Azimuth Tape (DA09004A), then set the N-581 in play mode.

(e) Turn the PH Azimuth Alignment Screw until the output of both channels becomes maximum.

(f) Repeat (b) through (e) for 1 – 2 times.

(2) Record Head Height Adjustment and Azimuth Alignment

(a) Place the Monitor Switch in the Tape position, then connect VTVM to the Output Jacks.

(b) Load a Reference SX Tape (DA09025A). Set the Eq. and Tape Switches of the N-581 to 70 μs and SX positions, then set the N-581 in record and play modes.

(c) Set the Tone Switch of the N-581 to 400 Hz, then turn the RH Height Gear until the output of both channels becomes maximum.

(d) Set the Tone Switch of the N-581 to 15 kHz, then turn the RH Azimuth Alignment Screw until the output of both channels becomes maximum.

(e) Repeat (c) and (d) for 1 – 2 times.

(f) After completion of both adjustment and alignment, record the 400 Hz tone to the same portion of both A and B sides of the tape.

(g) Immerse the recorded tape in a magnetized developing solution. In turn, check to insure that the recording head tracks across the center are separated with a distance of 0.55 to 0.75 mm (typically 0.65 mm) as illustrated in Fig. 5.14.

Note: Liquid for tape magnetized development solution
"MAGNA-SEE, SOUND CRAFT a product of CBS RECORDS a division of Columbia Broadcasting System, Inc., Danbury, Conn. 06810 U.S.A., or equivalent".
After development, clean the tape otherwise pressure rollers and heads will become dirty.

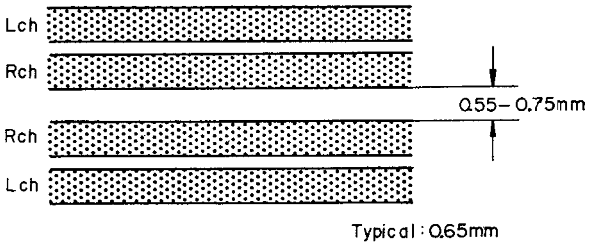


Fig. 5.14

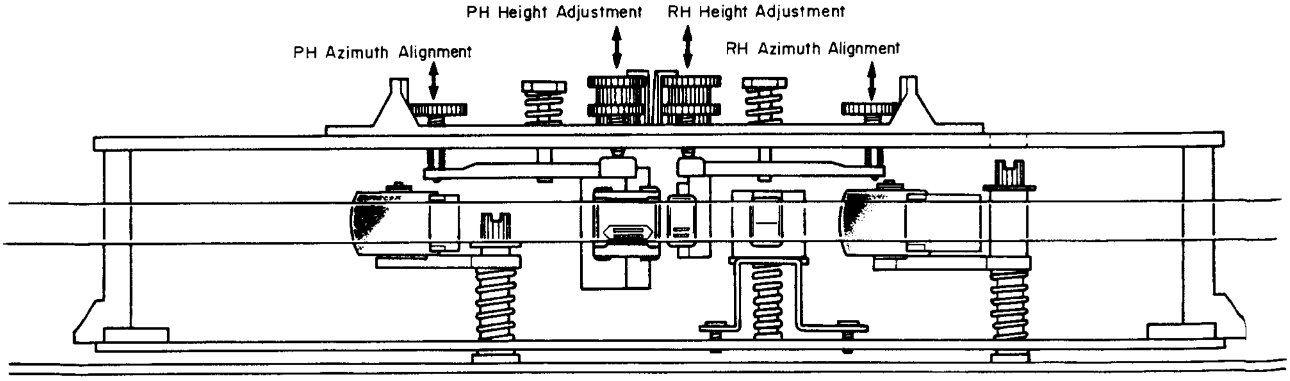


Fig. 5.13

5.8. Record Head Stroke Adjustment

Refer to Figs. 5.15 and 5.16.

Note: This adjustment will be required only to insure freedom from misalignment of the record head stroke in the record head stroke check mode.

(1) Check the accuracy of the record head stroke.

(2) Remove Head Mount Base Ass'y referring to item 3.28.

(3) Remove the record head assembly.

(4) Adjustment of Record Head Mounting Gauge M-9048 (DA09048A)

  (a) Mount the Block B onto the Mounting Gauge Plate.

  (b) Loosen the 2 screws fixing the Block A.

  (c) As shown in the Fig. 5.15, hold the Gauges (3.05 mm and 0.1 mm thickness) between the Block A and Block B, fix the Block A with screws, pushing the Block A to the 2 guide pins.

(5) Remove the Block B from the Mounting Gauge Plate.

(6) As shown in the Fig. 5.16, mount the R-54 record head assembly onto the Mounting Gauge Plate, then check the location of the R-54 record head surface. (If record head contacts to the Block C, loosen 2 pcs. of screws that assembled record head and R-54 record head assembly, then place the R-54 record head assembly onto the Plate.)

(7) Remove the R-54 record head assembly from the Mounting Gauge Plate.

(8) Readjustment of Record Head Mounting Gauge M-9048 (DA09048A)

  (a) Mount the Block B onto the Mounting Gauge Plate.

  (b) Loosen the 2 screws fixing the Block A.

  (c) As shown in the Fig. 5.15, hold the Gauges (3.05 mm and either one of 0.05, 0.15, 0.2, 0.25, 0.3 or 0.35 mm thickness) between the Block A and Block B, fix the Block A with screw, pushing the Block A to the 2 guide pins.

(9) Remove the Block B from the Mounting Gauge Plate.

(10) Mount the R-54 record head assembly onto the Mounting Gauge Plate.

(11) As shown in the Fig. 5.16, loosen the R-54 record head with 2 pcs. of screws onto the record head plate. As the location of the Block A is secured by the item (8) - (c), push the record head to the directions A and B, then tighten 2 pcs. of screws.

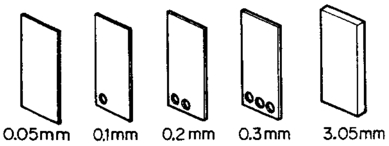
(12) Check to insure freedom from gap between the Block C and record head surface, then tight the 2 pcs. of screws on the record head plate with lock tight paint.

(13) Assemble the record head assembly to the head mount base assembly.

(14) Assemble the head mount base assembly to the mechanism assembly.

(15) Check the record head stroke.

If the above are inaccurate, items (1) through (15) will have to be repeated till satisfactory results are obtained.



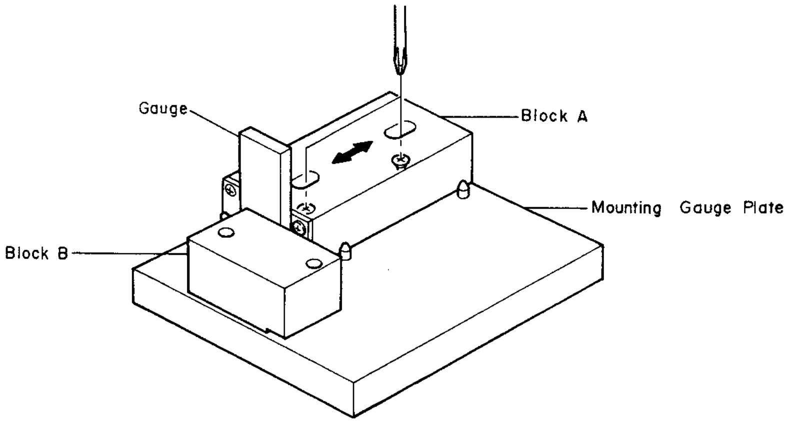


Fig. 5.15

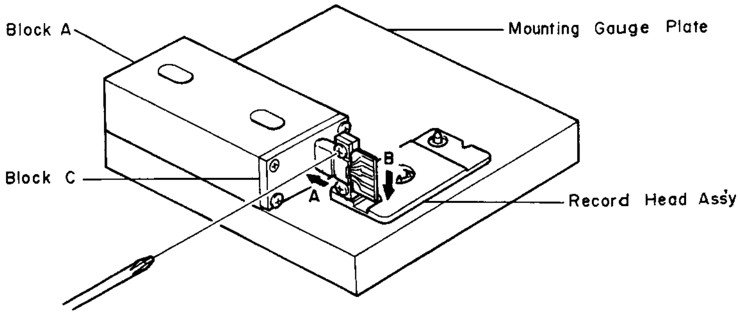


Fig. 5.16

5.9. Tape Travelling Adjustment

The adjustment shall be made with a modified version of the current type EXII C-90 as shown in Fig. 5.17 (error will be made if a current type Tape Travelling Cassette (DA09011A) should be used for this purpose).

While modifying an EXII C-90, the tape guides in the cassette housing shall be kept protected to avoid tilt.

Check shall be made in the following procedures:

(1) An EXII C-90 Tape thus modified shall be loaded onto the N-581.

(2) Release the back-tension (rotate the Supply Reel and feed out some length of tape) and set the N-581 in play mode.

(3) In this juncture, check to insure wheather the tape is free from waving or slippage from the tape guide.

(4) When the modified EXII C-90 is played back, check to insure wheather the tape is freedom from waving from head surface or at pressure rollers.

(5) If either of waving or slippage from the tape guide should be noted, adjustments of "5.3. Record Head and Playback Head Tilt Adjustment", "5.4. Head Base Stroke Adjustment", "5.5. Tape Guides Adjustment and Erase Head Stroke Adjustment", "5.6. Erase Head Height and Tilt Adjustment", "5.7. Playback Head and Record Head Height Adjustment and Azimuth Alignment", "5.8. Record Head Stroke Adjustment", etc. will be required.

As a case may be, the said waving or slippage may have been caused from defective supply Pressure Roller Ass'y or Take-up Pressure Roller Ass'y without parallel contact with capstans. If such are noted, the Pressure Roller Assemblies will have to be replaced.

Further, excessively weak take-up torque or strong take-up torque may cause defective tape travelling.

The N-581 is intended to be an adjustment-free Model, however if the similar matters as above should be noted, please replace the Reel Hub Ass'y to obtain appropriate take-up torque.

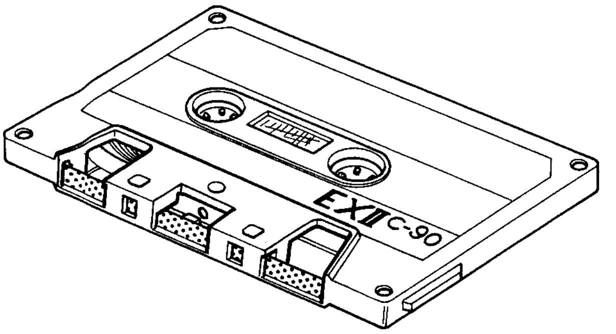


Fig. 5.17

5.10. Record Switch Linkage Adjustment

(1) Set the N-581 in stop mode.

(2) Loosen the screw of the Record Spring Holder, and shift the Record Spring Holder in order to remove the looseness of the Linkage Wire as shown in Fig. 5.18.1. Then tighten the screw for fixing the Record Spring Holder.
(In this case, the Record Switch should be positioned at Play side. If on the Record position, it will be defective.)

(3) Set the N-581 in record and pause mode.
Check to insure that the gap between the top of the wire and the Record Spring Holder is approx. 1 mm as shown in Fig. 5.18.2.
(Check that the Record Switch is in Record position.)

(4) Upon completion of the above adjustments, apply a quantity of lock tight paint.

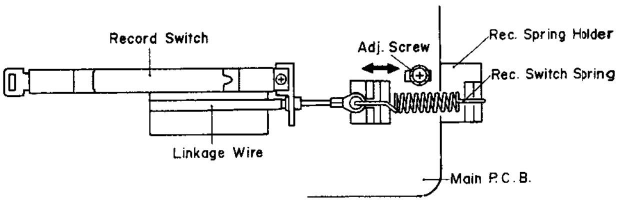


Fig. 5.18.1

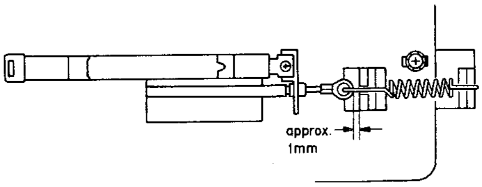


Fig. 5.18.2

5.11. Flywheel Holder Adjustment

(1) Refer to Fig. 5.19.
Tighten the Thrust Screws until the gap between the Flywheel Assemblies and Thrust Screws becomes minimized when both of the Capstan Shafts are moved backwardly and forwardly (the Thrust Springs between the Capstan Flanges and Flywheel Thrust Caps are in a flat state).
Excessive tightening of the Thrust Screws however will give damages on the Flywheel Assemblies, to which careful attention is invited.

(2) Return the Thrust Screws by 1/2 turn.

(3) Fixing the Thrust Screw with a screwdriver, lock the Lock Nut.

(4) Apply a quantity of lock tight paint to the Thrust Screws.

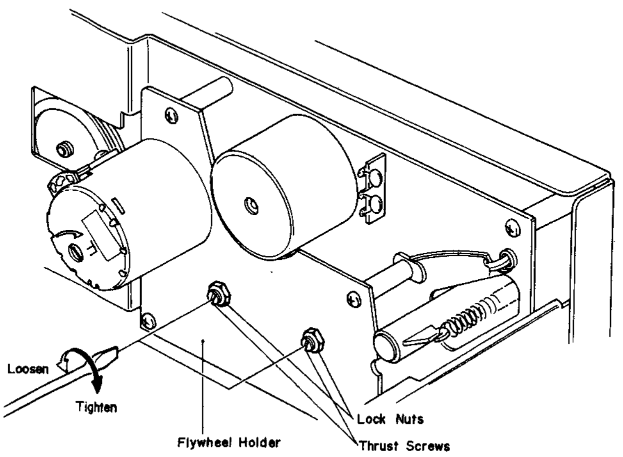


Fig. 5.19

5.12. Eject Wire Adjustment

(1) Referring to Fig. 5.20.1, insert a 1.5 mm spacer between the Eject Arm and Eject Stopper by turning the Eject Arm in the illustrated direction, then set the N-581 in playback mode.

(2) With pushing the Eject Arm by hand, loosen the screw and then pull the Eject Wire in the direction of the arrow until it stops as shown in Fig. 5.20.2.

(3) Tighten the screw, then apply a quantity of lock tight paint.

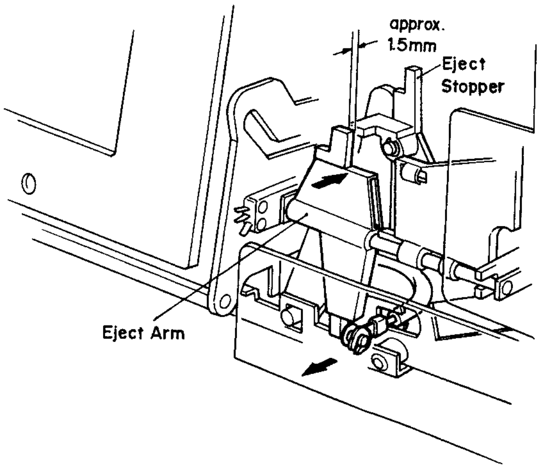


Fig. 5.20.1

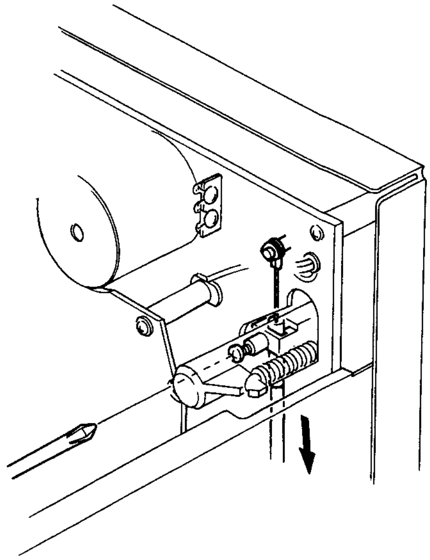


Fig. 5.20.2

5.13. Control Button Stroke Adjustment

Normal state of push button stroke for Logic Control on the Front Panel is as follows:

(1) When Front Panel is in place, push the Control Button with a finger tip and see if it has an allowance of 0.6 mm. If it does, then push it a little further for another 0.4 mm and see if the switch is ON.
This allowance can be adjusted by loosening the screws that assembled Control Button Holder and Front Chassis together. After the adjustment, lock the screws with lock tight paint.

(2) When performing adjustment, put the Front Panel aside, but for checking, do it with the Panel on.

5.14. Lubrication

N-581 is a lubrication-free cassette deck except when parts are replaced. Apply the following lubricant for each replaced part:

(1) LAUNA #100
Capstan Shaft
Pressure Roller Shaft
Thrust Cap

(2) FLOIL GB-TS-1
Reel Hub Shaft
Thrust portion on the Capstan Shaft
FLOIL GB-TS-1, made by Kanto Chemicals Co., Ltd., in Japan.
We suggest you use the above or equivalent type. If unavailable please contact Kanto Chemicals Co., Ltd., 2-7 Kanda Suda-cho Chiyoda-ku, Tokyo 101 Japan.

(3) Silicon Oil #3000CST
Air Damper Piston
Note: Excessive lubrication may cause defective damper action as the 0.2ϕ hole at the end of the cylinder may be filled with oil.

6. ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

6.1. Current Type (Serial No.: A30206060 –)

6.1.1. Parts Location for Electrical Adjustment

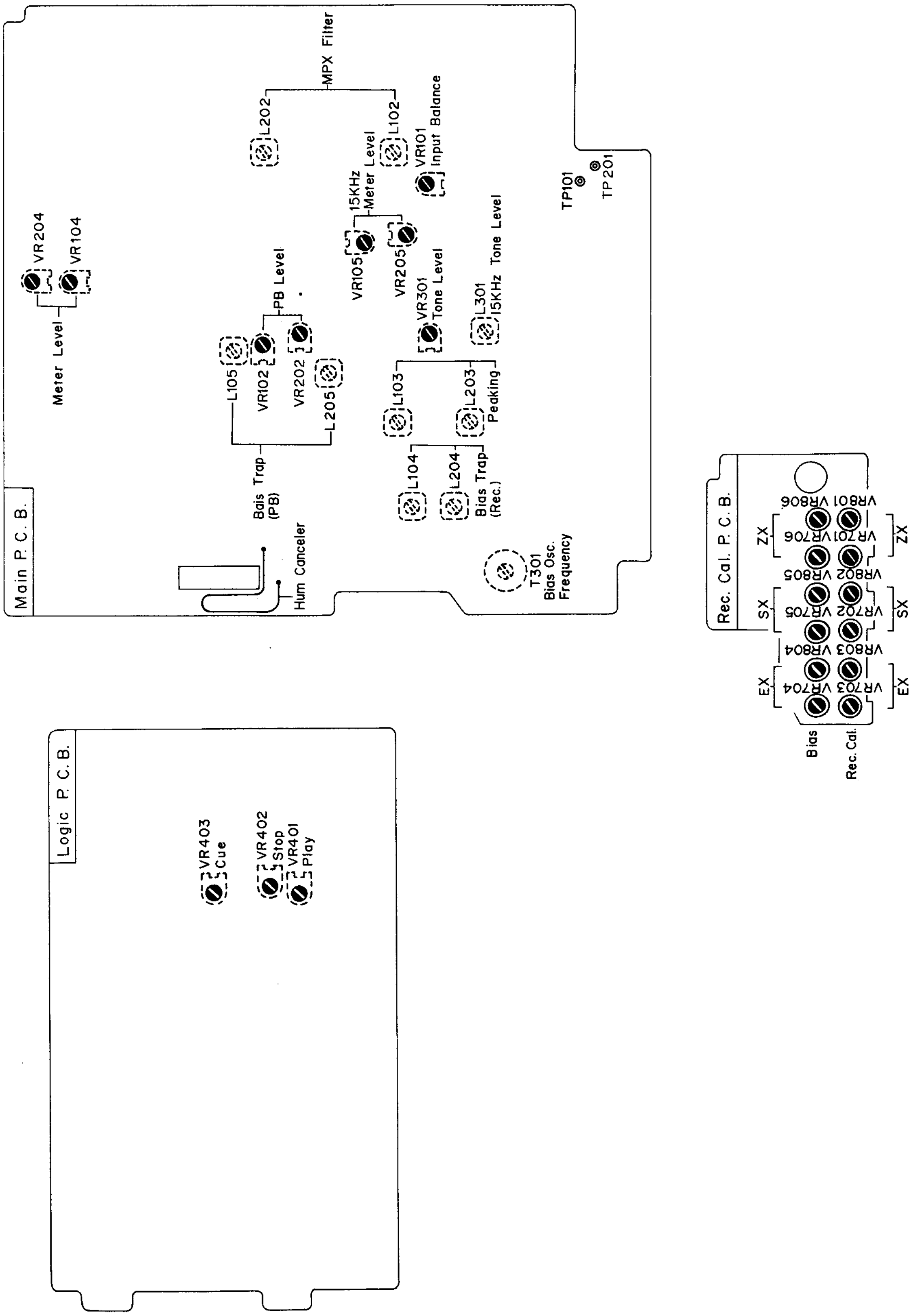

MPX Filter
L202
L102
VR101 Input Balance
15KHz Meter Level
VR105
VR205
TP101
TP201
VR204
VR104
Meter Level
PB Level
L105
VR102
VR202
L205
VR301 Tone Level
L301 15KHz Tone Level
L103
L203 Peaking
L104
L204
Bias Trap (Rec.)
Bias Trap (PB)
Hum Canceler
T301 Bias Osc. Frequency
Main P. C. B.
Rec. Cal. P. C. B.
VR801 VR806
VR701 VR706
VR802 VR805
VR702 VR705
VR803 VR804
VR703 VR704
ZX
SX
EX
Bias
Rec. Cal.
Logic P. C. B.
VR403 Cue
VR402 Stop
VR401 Play

Fig. 6.1.1 Serial No.: A30206060 –

6.1.2. Electrical Adjustments and Measurements

(1) Adjustment and Measurement Instructions

Note: Electrical adjustment should be performed after mechanical adjustment is completed.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
1	Tape Speed	3 kHz Speed and Wow/Flutter Tape (DA09006A)	Frequency Counter to OUTPUT Jacks	Playback	Capstan Motor Governor P.C.B. VR501	Adjust VR501 to obtain 3 kHz ± 0.5%. (VR501 is incorporated in the Motor.)
2	Tone Calibration	Test Tone 400 Hz and 15 kHz	VTVM to TP101, TP201 on the Main P.C.B.	Test Tone SW – 400/15 k	Main P.C.B. VR301, VR101, L301	1. Set the Test Tone Switch to 400 Hz. Turn output level control fully clockwise (maximum position). 2. Adjust VR301 to obtain 100 mV ± 0.2 dB on the VTVM at TP201 (output will be 1 V (0 dB)). 3. Adjust VR101 to obtain the same level as Right channel on the VTVM at TP101. 4. Set the Test Tone Switch to 15 kHz. 5. Adjust L301 to obtain 10 mV ± 0.5 dB on the VTVM. (output will be -20 dB against the level at 400 Hz).
3	Meter Level (400 Hz 0 dB)	400 Hz to INPUT Jacks	VTVM to TP101, TP201 on the Main P.C.B.	Record, Pause Tone SW – OFF	Main P.C.B. VR104, VR204	1. Feed in 400 Hz (0 dB) and adjust record level controls to obtain 100 mV ± 0.2 dB on the VTVM. Turn output level control fully clockwise (maximum position). 2. Adjust VR104 (VR204) to obtain 0 dB on the level meters (output will be 1 V (0 dB)). 3. Decrease input level by 10 dB/20 dB then short or open R160 (R260) and/or R161 (R261) to obtain minimum deviation from -10 dB/-20 dB on the level meters. (Perform at -10 dB and -20 dB.) 4. Again increase input level so that output will become 100 mV, then re-adjust VR104 (VR204) to obtain 0 dB on the level meters.

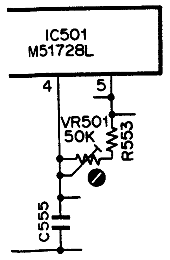

IC501
M51728L
4
5
VR501
50K
R553
C555

Fig. 6.1.2
1. Tape Speed

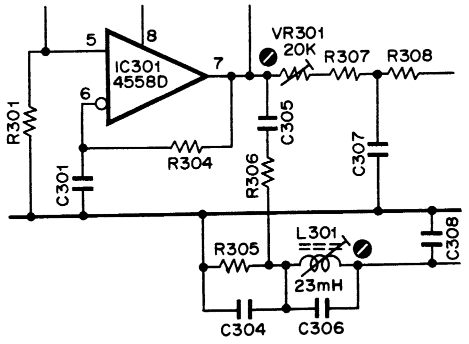

5
8
IC301
4558D
6
7
VR301
20K
R307
R308
R301
C301
R304
R306
C305
C307
R305
L301
23mH
C308
C304
C306

Fig. 6.1.3
2. Tone Calibration

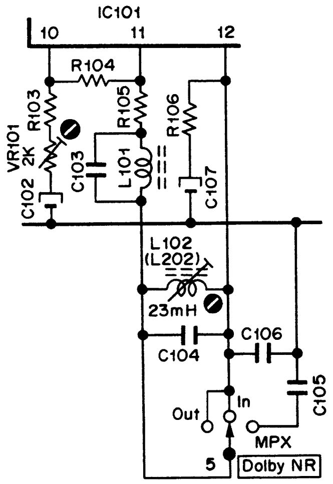

IC101
10
11
12
R104
R103
VR101
2K
C102
C103
R105
L101
R106
C107
L102
(L202)
23mH
C104
C106
C105
Out
In
MPX
5
Dolby NR

Fig. 6.1.4
2. Tone Calibration

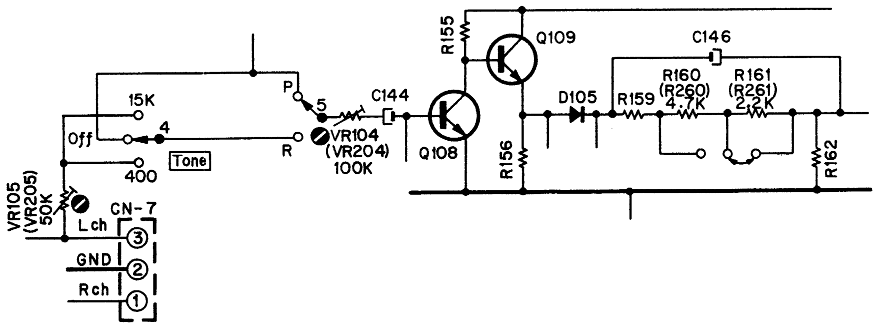

R155
Q109
C146
P
5
C144
15K
4
Off
Tone
R
VR104
(VR204)
100K
Q108
R156
D105
R159
R160
(R260)
4.7K
R161
(R261)
2.2K
R162
400
VR105
(VR205)
50K
CN-7
Lch
GND
Rch
③
②
①

Fig. 6.1.5
3. Meter Level

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
4	MPX Filter	19 kHz ±100 Hz to INPUT Jacks	VTVM to OUTPUT Jacks	Test Tone SW — OFF Dolby NR SW — OUT, IN/MPX	Main P.C.B. L102, L202	1. Turn output level control fully clockwise (maximum position). 2. Adjust input level control to obtain 1 V on the VTVM. 3. Set the Dolby NR Switch to IN/MPX position, then adjust L102 (L202) to obtain minimum reading on the VTVM (minimum reading will be less than -30 dB).
5	Playback Head Track Alignment	1 kHz Track Alignment Tape (DA09007A)	VTVM to OUTPUT Jacks	Playback Test Tone SW — OFF Eq. SW – 70 μs Dolby NR SW — OUT	Playback Head Height Adj. Screw	Adjust the Playback Head Height Adj. Screw to obtain minimum reading of both L and R channels on the VTVM. See "Playback Head Height Adjustment and Azimuth Alignment" in item 5.7.
6	Playback Head Azimuth Alignment	15 kHz Azimuth Tape (DA09004A)	VTVM to OUTPUT Jacks	Same as above	Playback Head Azimuth Alignment Screw	Adjust the Playback Head Azimuth Alignment Screw to obtain maximum reading of both L and R channels on the VTVM. See "Playback Head Height Adjustment and Azimuth Alignment" in item 5.7. Note: Repeat steps 5 and 6 one or two times to obtain optimum performance.
7	Playback Level	400 Hz Level Tape (DA09005A)	VTVM to TP101, TP201	Same as above	Main P.C.B. VR102, VR202	Adjust VR102 (VR202) to obtain 100 mV on the VTVM or 0 dB on the level meters.
8	Adjustment of Hum Canceler	Blank Tape	VTVM to OUTPUT Jacks	Playback Eq. SW – 70 μs Dolby NR SW — IN/MPX	Main P.C.B. Hum Canceler (Jumper wire)	Adjust Hum Canceler to obtain minimum reading of R channel on the VTVM.
9	Playback Frequency Response	400 Hz Level Tape (DA09005A) 10 kHz PB Frequency Response Tape (DA09003A) 15 kHz PB Frequency Response Tape (DA09002A) 20 kHz PB Frequency Response Tape (DA09001A)	VTVM to OUTPUT Jacks	Playback Tape SW – SX Eq. SW – 70 μs Dolby NR SW — OUT	Main P.C.B. R146, R246 R147, R247	1. Load the 400 Hz level tape and play it back. Adjust the output level control to a certain level (example 0 dB). 2. Load the 10 kHz, 15 kHz and 20 kHz PB frequency response tapes and adjust the playback head azimuth to give maximum levels on the VTVM with each tape. Short R146 (R246) and/or R147 (R247) to obtain the following level against 400 Hz level tape. Refer to Fig. 6.1.7. 10 kHz: -20 dB -1 dB to +2 dB 15 kHz: -20 dB -1 dB to +3 dB 20 kHz: -20 dB -1 dB to +4 dB 3. Conduct step 6 "Playback Head Azimuth Alignment". 4. If above is not sufficient, refer to "Playback Frequency Response Adjustment" in item 6.1.2-(2).
10	Bias Oscillation Frequency and Erase Current	Connect an additional 0.1 Ω resistor in series to the Erase Head	VTVM and Frequency Counter across the additional 0.1 Ω resistor	Record, Pause Tape SW – ZX Eq. SW – 70 μs Dolby NR SW — OUT	Main P.C.B. T301 R319, R341	1. Adjust T301 to obtain 105 kHz on the frequency counter. 2. Check the erase current by the VTVM. Erase current will be in a range of 310 mA to 400 mA (typically approx. 350 mA). If erase current is not sufficient, increase it by shorting R319 or R341. 3. After completion of the erase current adjustment, re-check the bias oscillation frequency.

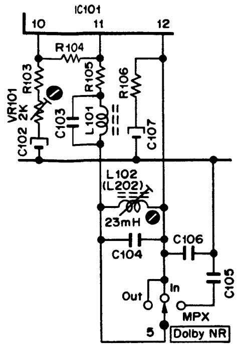

IC101
10
11
12
R104
R103
VR101 2K
C102
C103
L101
R105
R106
C107
L102 (L202)
23mH
C104
C106
C105
Out
In
MPX
5
Dolby NR

Fig. 6.1.6
4. MPX Filter

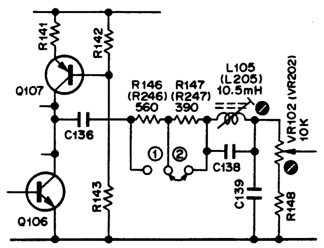

R141
R142
Q107
C136
R146 (R246) 560
R147 (R247) 390
L105 (L205) 10.5mH
VR102 (VR202) 10K
①
②
C138
C139
R143
R148
Q106

Fig. 6.1.7
7. Playback Level
13. Bias Trap (Playback Amp.)

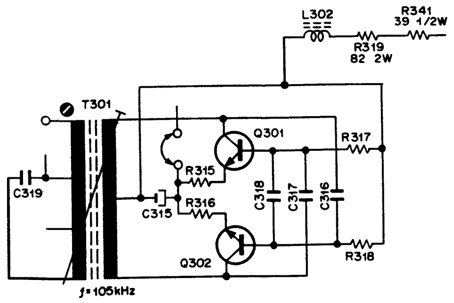

L302
R341 39 1/2W
R319 82 2W
T301
Q301
R317
R315
C319
C315
R316
C318
C317
C316
Q302
R318
f=105kHz

Fig. 6.1.8
10. Bias Oscillation Frequency and Erase Current

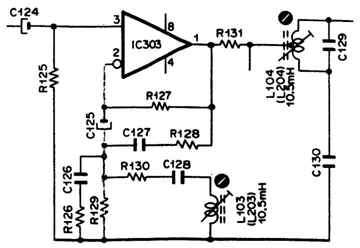

C124
IC303
R131
R125
R127
C125
C127
R128
R130
C128
C126
R126
R129
L104 (L204) 10.5mH
C129
C130
L103 (L203) 10.5mH

Fig. 6.1.9
11. Record Amplifier Equalizer
12. Bias Trap (Record Amp.)
17. Record/Playback Frequency Response

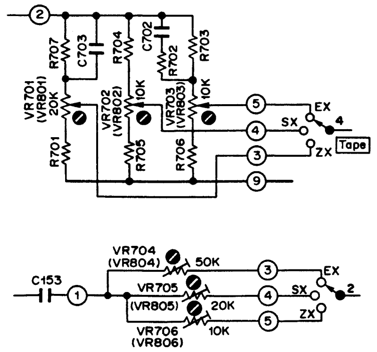

②
R707
C703
R704
C702
R702
R703
VR701 (VR801) 20K
VR702 (VR802) 10K
VR703 (VR803) 10K
R701
R705
R706
⑤ EX
④ SX
③ ZX
⑨
Tape
VR704 (VR804) 50K
VR705 (VR805) 20K
VR706 (VR806) 10K
C153
①
2

Fig. 6.1.10
16. Record Level and Recording Bias Current

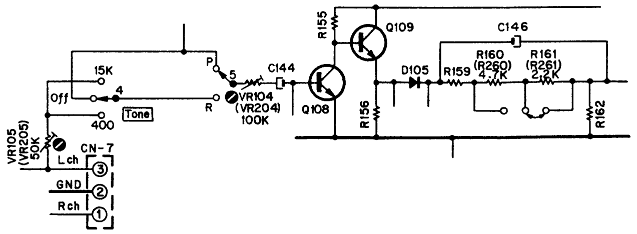

R155
Q109
C146
15K
Off
400
Tone
P
R
C144
VR104 (VR204) 100K
Q108
D105
R159
R160 (R260) 4.7K
R161 (R261) 2.2K
R156
R162
VR105 (VR205) 50K
CN-7
Lch
GND
Rch

Fig. 6.1.11
18. Monitor Amplifier

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
11	Record Amplifier Equalizer	23 kHz (-20 dB) to INPUT Jacks	VTVM to Main P.C.B. CN5-1, CN5-3	Record, Pause Tape SW – ZX Eq. SW – 70 μs Dolby NR SW – OUT	Main P.C.B. L103, L203	1. Remove the bias-cut-jumper from the dip side of the main P.C.B. 2. Adjust L103 (L203) to obtain peak reading at 23 kHz on the VTVM. 3. Re-solder the bias-cut-jumper.
12	Bias Trap (Record Amp.)	Remove Input Signals	Same as above	Same as above	Main P.C.B. L104, L204	Adjust L104 (L204) to obtain maximum reading on the VTVM.
13	Bias Trap (Playback Amp.)	Same as above	VTVM to Main P.C.B. CN7-3, CN7-1	Record, Pause Tape SW – ZX Eq. SW – 70 μs Dolby NR SW – OUT	Main P.C.B. L105, L205	Adjust L105 (L205) to obtain minimum reading on the VTVM.
14	Record Head Height Adjustment	Test Tone 400 Hz	Same as above	Record, Playback Tape SW – SX Eq. SW – 70 μs Dolby NR SW – OUT	Record Head Height Adj. Screw	Adjust the Record Head Height Adj. Screw to obtain maximum reading of L and R channels on the VTVM. See "Record Head Height Adjustment and Azimuth Alignment" in item 5.7.
15	Record Head Azimuth Alignment	Test Tone 15 kHz	Same as above	Same as above	Record Head Azimuth Alignment Screw	Adjust the Record Head Azimuth Alignment Screw to obtain maximum reading of L and R channels on the VTVM. See "Record Head Height Adjustment and Azimuth Alignment" in item 5.7.
16	Record Level Calibration and Recording Bias Current Adjustment	Test Tone 400 Hz and 15 kHz or 400 Hz and 15 kHz to INPUT Jacks	Same as above	Record, Playback Tape SW – EX/SX/ZX Eq. SW – 120 μs (EX) 70 μs (SX/ZX) Tone SW – 400 Hz/15 kHz Dolby NR SW – OUT	Rec. Cal. P.C.B. VR701, VR702, VR703, VR801, VR802, VR803, VR704, VR705, VR706, VR804, VR805, VR806	1. Set the Tone Switch to 400 Hz. 2. Record signals on the reference EXII tape (DA09021A), reference SX tape (DA09025A), or reference ZX tape (DA09037A), then play it back. 3. Adjust Rec. Cal. VR703 (VR803) (for EXII), VR702 (VR802) (for SX) and VR701 (VR801) (for ZX) to the center their positions. 4. Adjust Bias VR704 (VR804) (for EXII), VR705 (VR805) (for SX) and VR706 (VR806) (for ZX) to obtain maximum reading on the VTVM. 5. Set the Tone Switch to 15 kHz. 6. Adjust Bias VR704 (VR804), VR705 (VR805) and VR706 (VR806) to obtain the same readings as source monitor levels on the VTVM. 7. Set the Tone Switch to 400 Hz. 8. Adjust Rec. Cal. VR703 (VR803), VR702 (VR802) and VR701 (VR801) to obtain 0 dB on the level meters. 9. Repeat 5 through 8 as above two or three times to obtain optimum performance. 10. Check wheather Total Harmonic Distortion (T.H.D.) is less than 1.0% for EXII and SX tapes, and 0.8% for ZX tape.
17	Record/Playback Frequency Response	400 Hz (0 dB) and 20 Hz to 20 kHz (-20 dB) to INPUT Jacks	Same as above	Record, Playback Tape SW – EX/SX/ZX Eq. SW – 120 μs (EX) 70 μs (SX/ZX) Tone SW – OUT Dolby NR SW – OUT	Main P.C.B. L103, L203	1. Feed in 400 Hz (0 dB) and adjust record level controls to obtain 0 dB on the level meters. 2. Switch the Generator output level to -20 dB, then record and play it back. 3. Feed in 20 Hz to 20 kHz (-20 dB), and check to insure if the output levels are within -20 dB ± 3 dB. 4. If above is not sufficient, adjsut L103 (L203) to obtain approx. -20 dB on the VTVM. 5. Conduct step 16 "Record Level Calibration and Recording Bias Current Adjustment". 6. If above is not sufficient, precise re-adjustment of step 9 "Playback Frequency Response", replacement of Playback Head or Record Head, or check on item 5.9 "Tape Travelling Adjustment" will be required.
18	Adjustment of Monitor Amplifier	Test Tone 400 Hz and 15 kHz		Record and Playback Tone SW – 400/15 k Tape SW – SX Eq. SW – 70 μs Dolby NR SW – OUT	Main P.C.B. VR105, VR205	1. Set the Tone Switch to 400 Hz. 2. Load the reference SX tape (DA09025A), then record and play it back. Adjust VR105 (VR205) to obtain 0 dB on the level meters. 3. Set the Tone Switch to 15 kHz, then check to insure that the level meters flutter at 0 dB.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
19	Crosstalk	1 kHz to INPUT Jacks	1 kHz Band Pass Filter, VTVM to OUTPUT Jacks	Record and Playback Tape SW – ZX Eq. SW – 70 μs Dolby NR SW — OUT		1. Erase the tape with bulk eraser. 2. Adjust record level controls to obtain 0 dB on the level meters, and record the signals on the reference tape. 3. Turn the cassette tape the other way round and play it back. 4. Measure the difference between 2 and 3.
20	Channel Separation	1 kHz to INPUT Jacks	Same as above	Same as above		1. Erase the tape with bulk eraser. 2. Adjust Lch (Rch) record level control to obtain 0 dB on the level meter, and close Rch (Lch) record level control. 3. Record and play it back, then measure the Rch (Lch) level.
21	Erasure	1 kHz to INPUT Jacks	Same as above	Same as above		1. Erase the tape with bulk eraser. 2. Adjust record level controls to obtain 0 dB on the level meters, and record the signals on the reference tape. 3. Rewind the tape then close record level controls. 4. Record and play it back, then measure the difference between 2 and 3.
22	Signal to Noise Ratio	400 Hz to INPUT Jacks	VTVM and Distortion Meter to OUTPUT Jacks	Record and Playback Tape SW – ZX Eq. SW – 70 μs Dolby NR SW — IN/MPX		1. Feed in 400 Hz and record, and play it back. 2. Adjust the record level controls to obtain 3% total harmonic distortion in playback mode. 3. Close the record level controls then record. 4. After rewound, play back and check the output level difference between 2 and 3. Note: The filter of IHF-A curve shall be used in the measurements.
23	Total Harmonic Distortion	400 Hz to INPUT Jacks	Distortion Meter to OUTPUT Jacks	Record and Playback Tape SW – EX/SX/ZX Eq. SW – 120 μs (EX) 70 μs (SX/ZX) Dolby NR SW — OUT		1. Adjust record level controls to obtain 0 dB on the level meters. 2. Record and play it back. 3. Read the distortion meter and check to insure that the distortion is less than 1.0% for EXII and SX tapes, and 0.8% for ZX tape.
24	Wow/Flutter	3 kHz Speed and Wow/Flutter Tape (DA09006A)	Wow/Flutter Meter to OUTPUT Jacks	Playback Monitor SW — Tape Eq. SW – 70 μs		Playback and read the wow/flutter meter.

(2) Frequency Response Adjustment

(a) Playback Frequency Response Adjustment

Fig. 6.1.12 shows the playback equalization curve for N-581, and Fig. 6.1.13 is the circuit for adjustment.

1) Level Adjustment (for middle frequency response)
This adjustment will be required when playback level is not sufficient at 10 kHz PB Frequency Response Tape (refer to step 9 in "(1) Adjustment and Measurement Instructions").
Playback equalization level can be varied by the modification of R144 (R244) and R145 (R245).
Following are the details for level modification:

Approx. +1 dB	R145 (R245):	3.0K
	R144 (R244):	4.3K
0 dB	R145 (R245):	3.3K
	R144 (R244):	4.7K
Approx. -1 dB	R145 (R245):	3.6K
	R144 (R244):	5.1K

2) Peaking Adjustment (for high frequency response)
This adjustment will be required when playback level is not sufficient at 20 kHz PB Frequency Response Tape (refer to step 9 in "(1) Adjustment and Measurement Instructions").
Peaking portion compensates the gap loss of the playback head.
Peaking level is varied by the short circuit of R146 (R246) or R147 (R247) as illustrated in the figure.

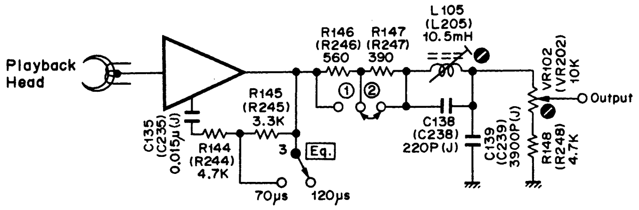


Fig. 6.1.13 Playback Amp.

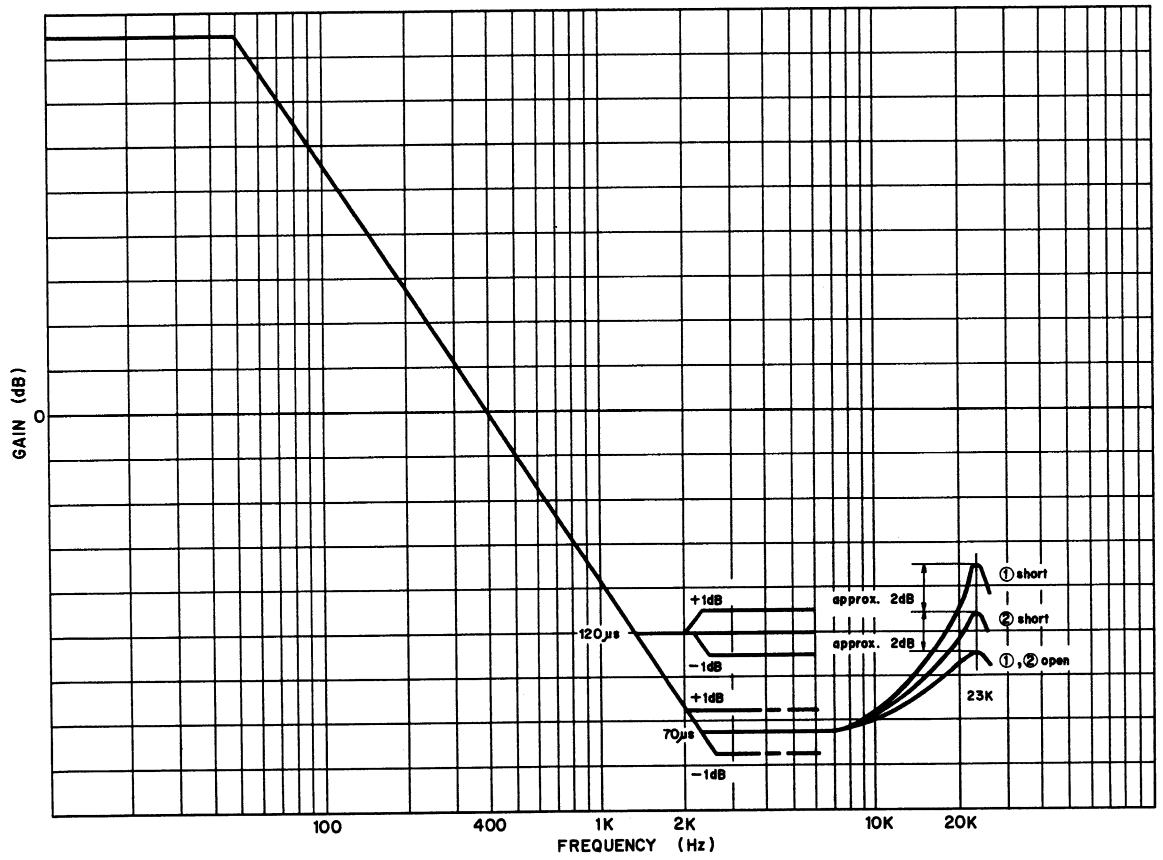


Fig. 6.1.12 Playback Equalization Curve

(b) Record Current Frequency Response Adjustment
Record Eq. peaking is adjusted for compensating the overall frequency response when playback frequency response is completed.
Normally however peaking frequency is pre-adjusted to approx. 23 kHz in Record mode. Refer to Fig. 6.1.14.

1) For ZX tape

a) Feed in 400 Hz (0 dB), then record and play it back.
Adjust bias current by VR706 (VR806) to obtain a 0.8 % distortion.

b) Feed in 10 kHz and 400 Hz (–20 dB) then record and play it back.
Check the difference of the levels between 10 kHz and 400 Hz, and mount an additional capacitor in parallel with the C122 (C222) from the dip side of the printed circuit board depending upon the difference of the levels against 400 Hz. Refer to Fig. 6.1.15.

	Add	Total
0 dB	0	1000 pF
-1 dB	470 pF	1470 pF
-2 dB	1000 pF	2000 pF

c) Feed in 20 kHz (–20 dB) then record and play it back.
Adjust record peaking coils L103 (L203) to obtain flat overall frequency response.

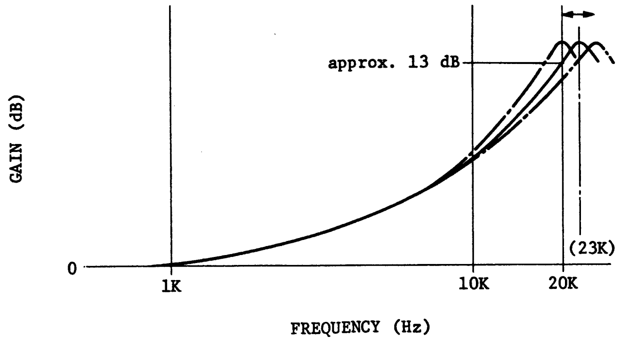


Fig. 6.1.14. Recording Peaking Curve

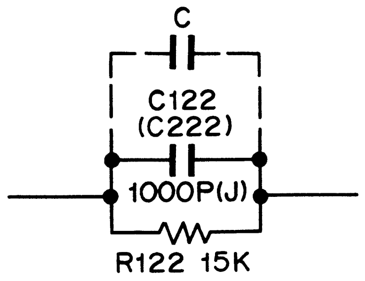


Fig. 6.1.15

2) For SX Tape

a) Feed in 15 kHz and 400 Hz (–20 dB), then record and play it back.
Adjust bias current by VR705 (VR805) to obtain flat overall frequency response.

b) Feed in 20 kHz and 400 Hz (–20 dB), then record and play it back.
And check to insure that the overall frequency response is flat.

3) For EX Tape

a) Feed in 15 kHz and 400 Hz (–20 dB), then record and play it back.
Adjust bias current by VR704 (VR804) to obtain flat overall frequency response.

b) Feed in 20 kHz and 400 Hz (–20 dB), then record and play it back.
And check to insure that the overall frequency response is flat.

(3) Dolby NR Circuit Check

Dolby NR circuit incorporates a Dolby B-Type NR IC (μA7300PC) which has no adjustment point.
Perform the folloiwng checks and make sure that the IC operates accurately i.e. frequency response through IC is accurate.

Signal Source:	5 kHz to INPUT Jacks
Output Connection:	VTVM to the output side of C119 (C219) on the Main P.C.B.
Mode:	Record Pause MPX SW – IN

(a) Remove the Bias-cut Jumper from the dip side of the Main P.C.B.

(b) Connect a VTVM to TP101 (TP201) on the Main P.C.B.
Feed in 5 kHz and adjust the input level so that the VTVM may read 100 mV (0 dB) at each Test Point.
Pointer on the meter will indicate 0 dB.

(c) Remove the VTVM from TP101 (TP201) and reconnect it to the output side of C119 (C219). Check to insure that the VTVM indicates approx. 560 mV.

(d) Decrease the input level (0 dB) by 20 dB or 30 dB. Check to insure that the level at output side of C119 (C219) corresponds to the following with the Dolby NR Switch IN and OUT.

(e) After completion of the adjustment, reconnect the Bias-cut Jumper.

Input Level	Capacitor Output Level		
(f=5 kHz)	Dolby NR OUT	Dolby NR IN	Difference between IN and OUT
–20 dB	–20 dB	–16.8 dB ± 1.5 dB	3.2 dB ± 1.5 dB
–30 dB	–30 dB	–21.8 dB ± 1.5 dB	8.2 dB ± 1.5 dB

6.2 Previous Type (Serial Nos.: A30201001 – A30206059)

6.2.1. Parts Location for Electrical Adjustment

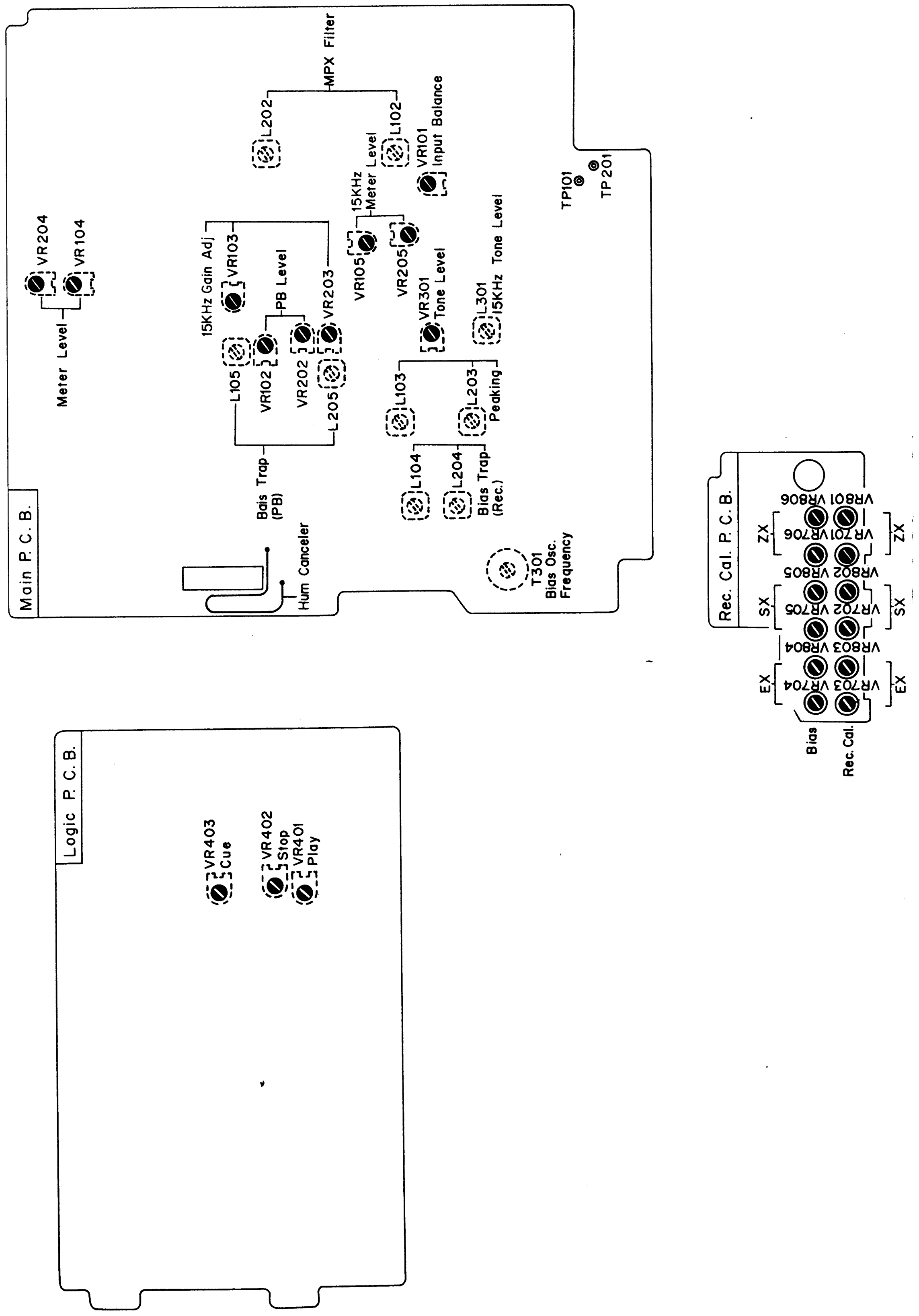

MPX Filter
L202
L102
VR101 Input Balance
15KHz Meter Level
VR105
VR205
VR301 Tone Level
L301 15KHz Tone Level
TP101
TP201
VR204
VR104
Meter Level
15KHz Gain Adj
VR103
PB Level
VR203
L105
VR102
VR202
L205
L103
L203 Peaking
L104
L204
Bias Trap (Rec.)
Bais Trap (PB)
Hum Canceler
T301 Bias Osc. Frequency
Main P. C. B.
Rec. Cal. P. C. B.
ZX
SX
EX
VR801
VR806
VR701
VR706
VR802
VR805
VR702
VR705
VR803
VR804
VR703
VR704
Bias
Rec. Cal.
Logic P. C. B.
VR403 Cue
VR402 Stop
VR401 Play

Fig. 6.2.1-A Serial Nos.: A30205002 – A30206059

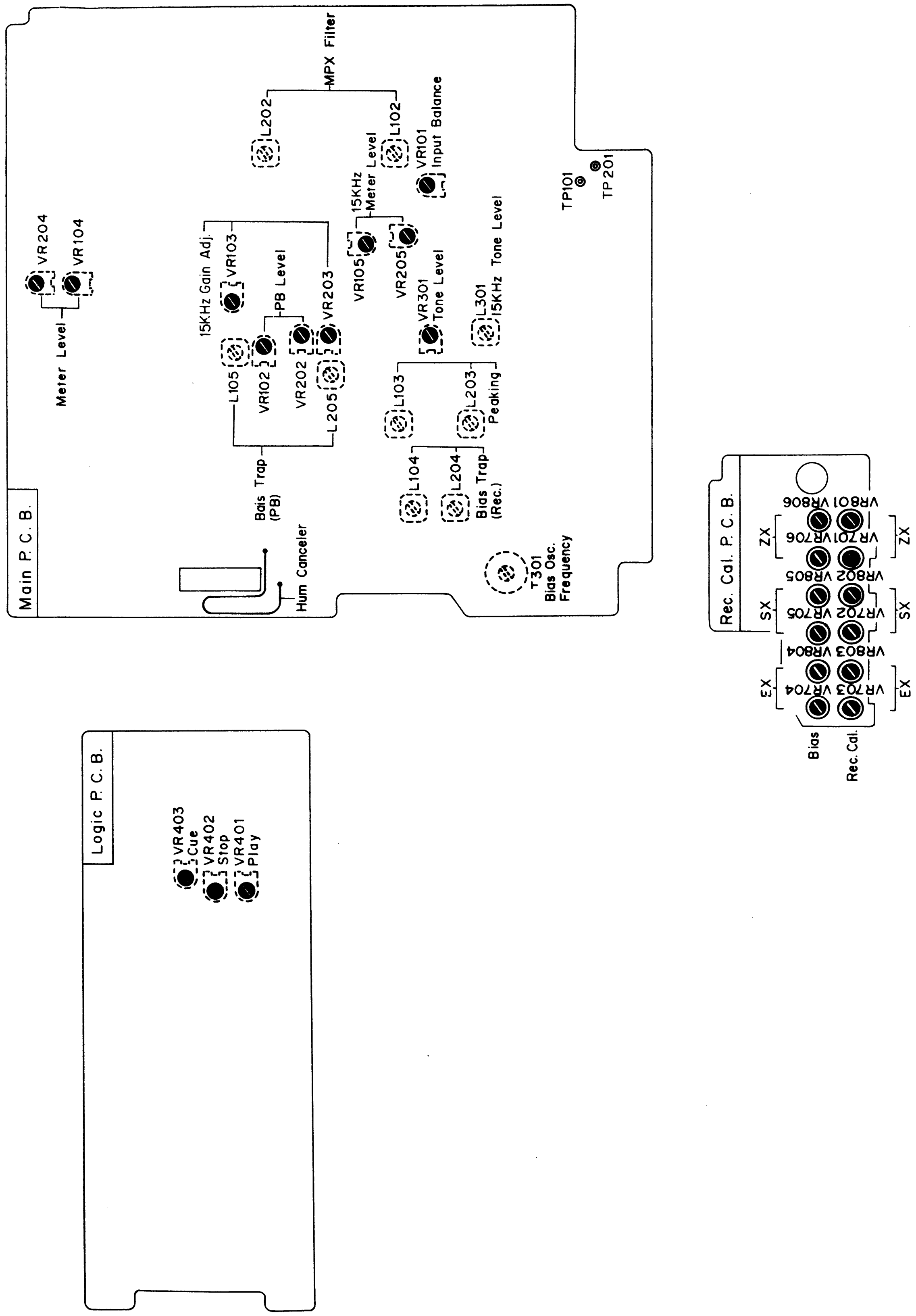

MPX Filter
L202
L102
VR101 Input Balance
15KHz Meter Level
VR105
VR205
VR301 Tone Level
L301 15KHz Tone Level
TP101
TP201
VR204
VR104
Meter Level
15KHz Gain Adj
VR103
PB Level
VR203
L105
VR102
VR202
L205
L103
L203 Peaking
L104
L204
Bias Trap (Rec.)
Bais Trap (PB)
Hum Canceler
T301 Bias Osc. Frequency
Main P. C. B.
Rec. Cal. P. C. B.
ZX
SX
EX
VR801
VR806
VR701
VR706
VR802
VR805
VR702
VR705
VR803
VR804
VR703
VR704
Bias
Rec. Cal.
Logic P. C. B.
VR403 Cue
VR402 Stop
VR401 Play

Fig. 6.2.1-B Serial Nos.: A30201001 – A30205001

6.2.2. Electrical Adjustments and Measurements

(1) Adjustment and Measurement Instructions

Note: Electrical adjustment should be performed after mechanical adjustment is completed.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
1	Tape Speed	3 kHz Speed and Wow/Flutter Tape (DA09006A)	Frequency Counter to OUTPUT Jacks	Playback	Capstan Motor Governor P.C.B. VR501	Adjust VR501 to obtain 3 kHz ± 0.5%. (VR501 is incorporated in the Motor.)
2	Tone Calibration	Test Tone 400 Hz and 15 kHz	VTVM to TP101, TP201 on the Main P.C.B.	Test Tone SW – 400/15 k	Main P.C.B. VR301, VR101, L301	1. Set the Test Tone Switch to 400 Hz. Turn output level control fully clockwise (maximum position). 2. Adjust VR301 to obtain 100 mV ± 0.2 dB on the VTVM at TP201 (output will be 1 V (0 dB)). 3. Adjust VR101 to obtain the same level as Right channel on the VTVM at TP101. 4. Set the Test Tone Switch to 15 kHz. 5. Adjust L301 to obtain 10 mV ± 0.5 dB on the VTVM. (output will be -20 dB against the level at 400 Hz).
3	Meter Level (400 Hz 0 dB)	400 Hz to INPUT Jacks	VTVM to TP101, TP201 on the Main P.C.B.	Record, Pause Tone SW – OFF	Main P.C.B. VR104, VR204	1. Feed in 400 Hz (0 dB) and adjust record level controls to obtain 100 mV ± 0.2 dB on the VTVM. Turn output level control fully clockwise (maximum position). 2. Adjust VR104 (VR204) to obtain 0 dB on the level meters (output will be 1 V (0 dB)). 3. Decrease input level by 10 dB/20 dB then short or open R160 (R260) and/or R161 (R261) to obtain minimum deviation from -10 dB/-20 dB on the level meters. (Perform at -10 dB and -20 dB.) 4. Again increase input level so that output will become 100 mV, then re-adjust VR104 (VR204) to obtain 0 dB on the level meters.
4	Meter Level 15 kHz	15 kHz to Pin No. 5, 3 of IC304 or 15 kHz PB Frequency Response Tape (DA09002A)	VTVM to CN7-3 and CN7-1 on the Main P.C.B.	Tone SW – 15 kHz or Playback Tape SW – SX Eq. SW – 70 μs Tone SW – OFF/15 kHz	Main P.C.B. VR103, VR203	1. Set the Tone Switch to 15 kHz. 2. Feed in 15 kHz (30 mV) to pin No. 5 (3) of IC304. 3. Adjust VR103 (VR203) to obtain 20 dB gain at CN7-3 (CN7-1) on the VTVM. or 1. Set the Tone Switch to Off. 2. Load the 15 kHz PB frequency response tape (DA09002A), then play it back. 3. Set the Tone Switch to 15 kHz, then adjust VR103 (VR203) to obtain 20 dB higher gain on the VTVM against the level at Tone Switch Off. Note: Output of CN7-3 (CN7-1) is approx. 400 – 500 mV at 0 dB level.

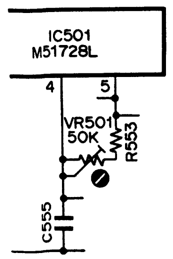

IC501
M51728L
4
5
VR501
50K
R553
C555

Fig. 6.2.2
1. Tape Speed

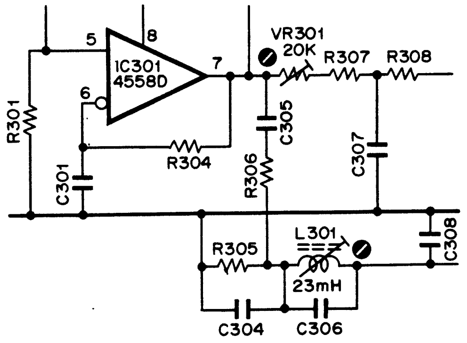

5
8
IC301
4558D
6
7
VR301
20K
R307
R308
R301
R304
C305
C301
R306
C307
C308
R305
L301
23mH
C304
C306

Fig. 6.2.3
2. Tone Calibration

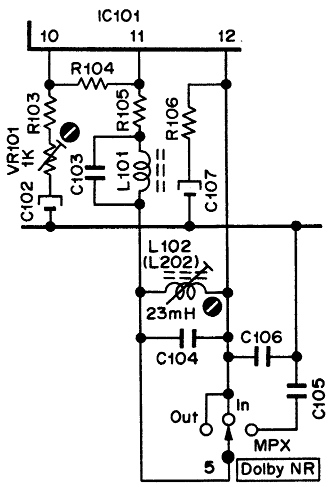

IC101
10
11
12
R104
R103
VR101 1K
R105
R106
C102
C103
L101
C107
L102
(L202)
23mH
C104
C106
C105
Out
In
MPX
5
Dolby NR

Fig. 6.2.4
2. Tone Calibration

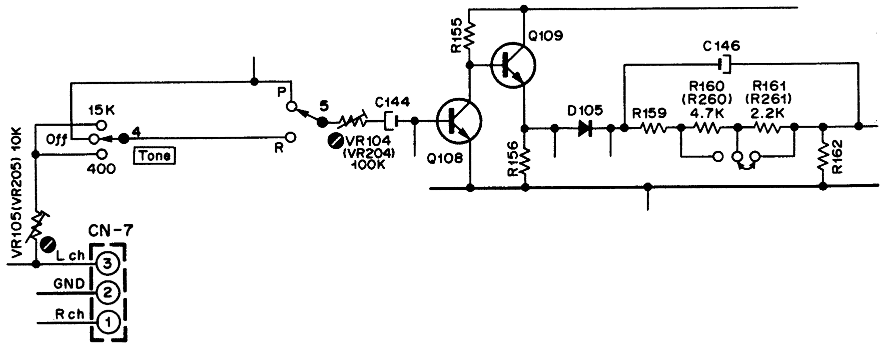

R155
Q109
C146
R160 (R260) 4.7K
R161 (R261) 2.2K
15K
P
5
C144
D105
R159
Off
4
400
Tone
R
VR104 (VR204) 100K
Q108
R156
R162
VR105(VR205) 10K
CN-7
L ch
GND
R ch
3
2
1

Fig. 6.2.5
3. Meter Level (400 Hz)

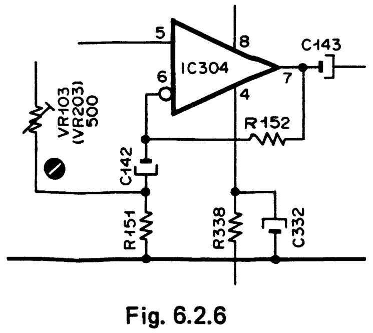

5
8
C143
IC304
6
4
7
VR103 (VR203) 500
R152
C142
R151
R338
C332

Fig. 6.2.6
4. Meter Level (15 kHz)

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
5	MPX Filter	19 kHz ±100 Hz to INPUT Jacks	VTVM to OUTPUT Jacks	Test Tone SW – OFF Dolby NR SW – OUT, IN/MPX	Main P.C.B. L102, L202	1. Turn output level control fully clockwise (maximum position). 2. Adjust input level control to obtain 1 V on the VTVM. 3. Set the Dolby NR Switch to IN/MPX position, then adjust L102 (L202) to obtain minimum reading on the VTVM (minimum reading will be less than -30 dB).
6	Playback Head Track Alignment	1 kHz Track Alignment Tape (DA09007A)	VTVM to OUTPUT Jacks	Playback Test Tone SW – OFF Eq. SW – 70 µs Dolby NR SW – OUT	Playback Head Height Adj. Screw	Adjust the Playback Head Height Adj. Screw to obtain minimum reading of both L and R channels on the VTVM. See "Playback Head Height Adjustment and Azimuth Alignment" in item 5.7.
7	Playback Head Azimuth Alignment	15 kHz Azimuth Tape (DA09004A)	VTVM to OUTPUT Jacks	Same as above	Playback Head Azimuth Alignment Screw	Adjust the Playback Head Azimuth Alignment Screw to obtain maximum reading of both L and R channels on the VTVM. See "Playback Head Height Adjustment and Azimuth Alignment" in item 5.7. Note: Repeat steps 6 and 7 one or two times to obtain optimum performance.
8	Playback Level	400 Hz Level Tape (DA09005A)	VTVM to TP101, TP201	Same as above	Main P.C.B. VR102, VR202	Adjust VR102 (VR202) to obtain 100 mV on the VTVM or 0 dB on the level meters.
9	Adjustment of Hum Canceler	Blank Tape	VTVM to OUTPUT Jacks	Playback Eq. SW – 70 µs Dolby NR SW – IN/MPX	Main P.C.B. Hum Canceler (Jumper wire)	Adjust Hum Canceler to obtain minimum reading of R channel on the VTVM.
10	Playback Frequency Response	400 Hz Level Tape (DA09005A) 10 kHz PB Frequency Response Tape (DA09003A) 15 kHz PB Frequency Response Tape (DA09002A) 20 kHz PB Frequency Response Tape (DA09001A)	VTVM to OUTPUT Jacks	Playback Tape SW – SX Eq. SW – 70 µs Dolby NR SW – OUT	Main P.C.B. R146, R246 R147, R247	1. Load the 400 Hz level tape and play it back. Adjust the output level control to a certain level (example 0 dB). 2. Load the 10 kHz, 15 kHz and 20 kHz PB frequency response tapes and adjust the playback head azimuth to give maximum levels on the VTVM with each tape. Short R146 (R246) and/or R147 (R247) to obtain the following level against 400 Hz level tape. Refer to Fig. 6.2.8. 10 kHz: -20 dB -1 dB to +2 dB 15 kHz: -20 dB -1 dB to +3 dB 20 kHz: -20 dB -1 dB to +4 dB 3. Conduct step 6 "Playback Head Azimuth Alignment". 4. If above is not sufficient, refer to "Playback Frequency Response Adjustment" in item 6.2.2-(2).
11	Bias Oscillation Frequency and Erase Current	Connect an additional 0.1 Ω resistor in series to the Erase Head	VTVM and Frequency Counter across the additional 0.1 Ω resistor	Record, Pause Tape SW – ZX Eq. SW – 70 µs Dolby NR SW – OUT	Main P.C.B. T301 R319, R341	1. Adjust T301 to obtain 105 kHz on the frequency counter. 2. Check the erase current by the VTVM. Erase current will be in a range of 310 mA to 400 mA (typically approx. 350 mA). If erase current is not sufficient, increase it by shorting R319 or R341. 3. After completion of the erase current adjustment, re-check the bias oscillation frequency.

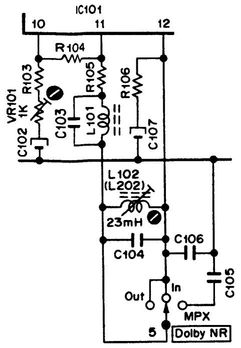

IC101
10
11
12
R104
R103
VR101 1K
R105
R106
C102
C103
L101
C107
L102 (L202)
23mH
C104
C106
C105
Out
In
MPX
5
Dolby NR

Fig. 6.2.7
5. MPX Filter

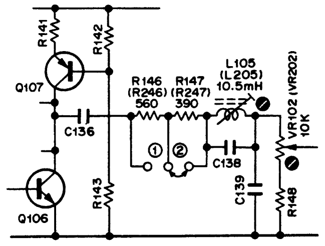

R141
R142
Q107
C136
R146 (R246) 560
R147 (R247) 390
L105 (L205) 10.5mH
VR102 (VR202) 10K
①
②
C138
C139
R148
R143
Q106

Fig. 6.2.8
8. Playback Level
14. Bias Trap (Playback Amp.)

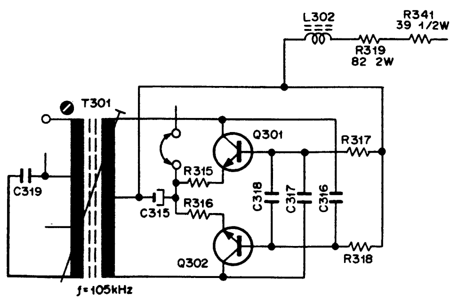

L302
R341 39 1/2W
R319 82 2W
T301
Q301
R317
R315
R316
C315
C318
C317
C316
C319
Q302
R318
f=105kHz

Fig. 6.2.9
11. Bias Oscillation Frequency and Erase Current

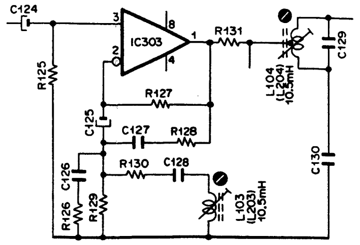

C124
3
8
2
4
1
IC303
R131
C129
L104 (L204) 10.5mH
R125
R127
C125
C127
R128
R130
C128
C126
R126
R129
L103 (L203) 10.5mH
C130

Fig. 6.2.10
12. Record Amplifier Equalizer
13. Bias Trap (Record Amp.)
18. Record/Playback Frequency Response

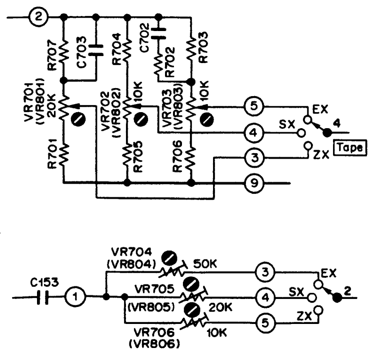

②
R707
C703
R704
C702
R702
R703
VR701 (VR801) 20K
VR702 (VR802) 10K
VR703 (VR803) 10K
R701
R705
R706
⑤
④
③
⑨
EX
SX
ZX
4
Tape
C153
①
VR704 (VR804) 50K
VR705 (VR805) 20K
VR706 (VR806) 10K
③
④
⑤
EX
SX
ZX
2

Fig. 6.2.11
17. Record Level and Recording Bias Current

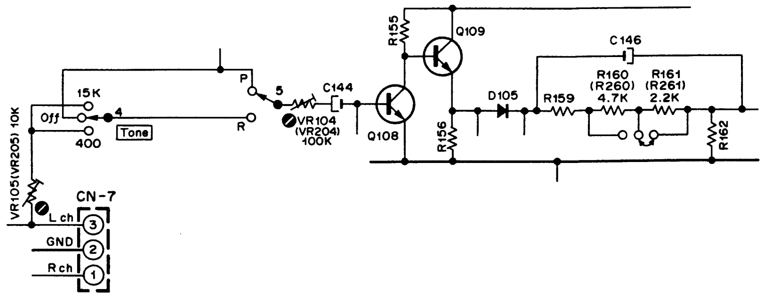

15K
Off
400
4
Tone
P
R
5
C144
VR104 (VR204) 100K
VR105 (VR205) 10K
CN-7
L ch
GND
R ch
③
②
①
R155
Q109
Q108
R156
C146
D105
R159
R160 (R260) 4.7K
R161 (R261) 2.2K
R162

Fig. 6.2.12
19. Monitor Amplifier

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
12	Record Amplifier Equalizer	23 kHz (-20 dB) to INPUT Jacks	VTVM to Main P.C.B. CN5-1, CN5-3	Record, Pause Tape SW – ZX Eq. SW – 70 μs Dolby NR SW – OUT	Main P.C.B. L103, L203	1. Remove the bias-cut-jumper from the dip side of the main P.C.B. 2. Adjust L103 (L203) to obtain peak reading at 23 kHz on the VTVM. 3. Re-solder the bias-cut-jumper.
13	Bias Trap (Record Amp.)	Remove Input Signals	Same as above	Same as above	Main P.C.B. L104, L204	Adjust L104 (L204) to obtain maximum reading on the VTVM.
14	Bias Trap (Playback Amp.)	Same as above	VTVM to Main P.C.B. CN7-3, CN7-1	Record, Pause Tape SW – ZX Eq. SW – 70 μs Dolby NR SW – OUT	Main P.C.B. L105, L205	Adjust L105 (L205) to obtain minimum reading on the VTVM.
15	Record Head Height Adjustment	Test Tone 400 Hz	Same as above	Record, Playback Tape SW – SX Eq. SW – 70 μs Dolby NR SW – OUT	Record Head Height Adj. Screw	Adjust the Record Head Height Adj. Screw to obtain maximum reading of L and R channels on the VTVM. See "Record Head Height Adjustment and Azimuth Alignment" in item 5.7.
16	Record Head Azimuth Alignment	Test Tone 15 kHz	Same as above	Same as above	Record Head Azimuth Alignment Screw	Adjust the Record Head Azimuth Alignment Screw to obtain maximum reading of L and R channels on the VTVM. See "Record Head Height Adjustment and Azimuth Alignment" in item 5.7.
17	Record Level Calibration and Recording Bias Current Adjustment	Test Tone 400 Hz and 15 kHz or 400 Hz and 15 kHz to INPUT Jacks	Same as above	Record, Playback Tape SW – EX/SX/ZX Eq. SW – 120 μs (EX) 70 μs (SX/ZX) Tone SW – 400 Hz/15 kHz Dolby NR SW – OUT	Rec. Cal. P.C.B. VR701, VR702, VR703, VR801, VR802, VR803, VR704, VR705, VR706, VR804, VR805, VR806	1. Set the Tone Switch to 400 Hz. 2. Record signals on the reference EXII tape (DA09021A), reference SX tape (DA09025A), or reference ZX tape (DA09037A), then play it back. 3. Adjust Rec. Cal. VR703 (VR803) (for EXII), VR702 (VR802) (for SX) and VR701 (VR801) (for ZX) to the center their positions. 4. Adjust Bias VR704 (VR804) (for EXII), VR705 (VR805) (for SX) and VR706 (VR806) (for ZX) to obtain maximum reading on the VTVM. 5. Set the Tone Switch to 15 kHz. 6. Adjust Bias VR704 (VR804), VR705 (VR805) and VR706 (VR806) to obtain the same readings as source monitor levels on the VTVM. 7. Set the Tone Switch to 400 Hz. 8. Adjust Rec. Cal. VR703 (VR803), VR702 (VR802) and VR701 (VR801) to obtain 0 dB on the level meters. 9. Repeat 5 through 8 as above two or three times to obtain optimum performance. 10. Check wheather Total Harmonic Distortion (T.H.D.) is less than 1.0% for EXII and SX tapes, and 0.8% for ZX tape.
18	Record/Playback Frequency Response	400 Hz (0 dB) and 20 Hz to 20 kHz (-20 dB) to INPUT Jacks	Same as above	Record, Playback Tape SW – EX/SX/ZX Eq. SW – 120 μs (EX) 70 μs (SX/ZX) Tone SW – OUT Dolby NR SW – OUT	Main P.C.B. L103, L203	1. Feed in 400 Hz (0 dB) and adjust record level controls to obtain 0 dB on the level meters. 2. Switch the Generator output level to -20 dB, then record and play it back. 3. Feed in 20 Hz to 20 kHz (-20 dB), and check to insure if the output levels are within -20 dB ± 3 dB. 4. If above is not sufficient, adjsut L103 (L203) to obtain approx. -20 dB on the VTVM. 5. Conduct step 17 "Record Level Calibration and Recording Bias Current Adjustment". 6. If above is not sufficient, precise re-adjustment of step 10 "Playback Frequency Response", replacement of Playback Head or Record Head, or check on item 5.9 "Tape Travelling Adjustment" will be required.
19	Adjustment of Monitor Amplifier	Test Tone 400 Hz and 15 kHz		Record and Playback Tone SW – 400/15 k Tape SW – SX Eq. SW – 70 μs Dolby NR SW – OUT	Main P.C.B. VR105, VR205	1. Set the Tone Switch to 400 Hz. 2. Load the reference SX tape (DA09025A), then record and play it back. Adjust VR105 (VR205) to obtain 0 dB on the level meters. 3. Set the Tone Switch to 15 kHz, then check to insure that the level meters flutter at 0 dB.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
20	Crosstalk	1 kHz to INPUT Jacks	1 kHz Band Pass Filter, VTVM to OUTPUT Jacks	Record and Playback Tape SW – ZX Eq. SW – 70 μs Dolby NR SW – OUT		1. Erase the tape with bulk eraser. 2. Adjust record level controls to obtain 0 dB on the level meters, and record the signals on the reference tape. 3. Turn the cassette tape the other way round and play it back. 4. Measure the difference between 2 and 3.
21	Channel Separation	1 kHz to INPUT Jacks	Same as above	Same as above		1. Erase the tape with bulk eraser. 2. Adjust Lch (Rch) record level control to obtain 0 dB on the level meter, and close Rch (Lch) record level control. 3. Record and play it back, then measure the Rch (Lch) level.
22	Erasure	1 kHz to INPUT Jacks	Same as above	Same as above		1. Erase the tape with bulk eraser. 2. Adjust record level controls to obtain 0 dB on the level meters, and record the signals on the reference tape. 3. Rewind the tape then close record level controls. 4. Record and play it back, then measure the difference between 2 and 3.
23	Signal to Noise Ratio	400 Hz to INPUT Jacks	VTVM and Distortion Meter to OUTPUT Jacks	Record and Playback Tape SW – ZX Eq. SW – 70 μs Dolby NR SW – IN/MPX		1. Feed in 400 Hz and record, and play it back. 2. Adjust the record level controls to obtain 3% total harmonic distortion in playback mode. 3. Close the record level controls then record. 4. After rewound, play back and check the output level difference between 2 and 3. Note: The filter of IHF-A curve shall be used in the measurements.
24	Total Harmonic Distortion	400 Hz to INPUT Jacks	Distortion Meter to OUTPUT Jacks	Record and Playback Tape SW – EX/SX/ZX Eq. SW – 120 μs (EX) 70 μs (SX/ZX) Dolby NR SW – OUT		1. Adjust record level controls to obtain 0 dB on the level meters. 2. Record and play it back. 3. Read the distortion meter and check to insure that the distortion is less than 1.0% for EXII and SX tapes, and 0.8% for ZX tape.
25	Wow/Flutter	3 kHz Speed and Wow/Flutter Tape (DA09006A)	Wow/Flutter Meter to OUTPUT Jacks	Playback Monitor SW – Tape Eq. SW – 70 μs		Playback and read the wow/flutter meter.

(2) Frequency Response Adjustment

Same as the current type, please refer to item 6.1.2-(2) on page 50.

(3) Dolby NR Circuit Check

Same as the current type, please refer to item 6.1.2-(3) on page 50.

7. MOUNTING DIAGRAMS AND PARTS LIST

Note: Mounting diagram shows a dip side view of the printed circuit board.

7.1. Control Switch P.C.B. Ass'y

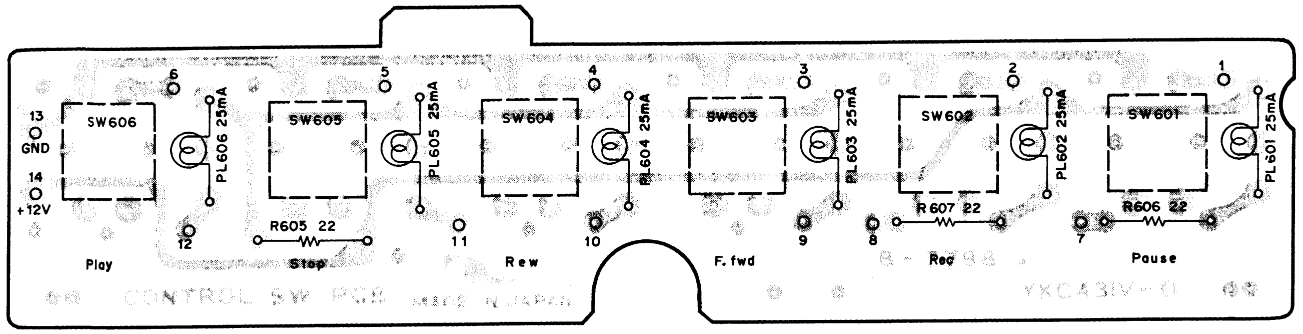

SW606
SW605
SW604
SW603
SW602
SW601
PL606 25mA
PL605 25mA
PL604 25mA
PL603 25mA
PL602 25mA
PL601 25mA
13
GND
14
+12V
R605 22
R607 22
R606 22
Play
Stop
Rew
F. fwd
Rec
Pause
CONTROL SW PCB
MADE IN JAPAN
YKC431V-0

Fig. 7.1

7.2. Volume P.C.B. Ass'y

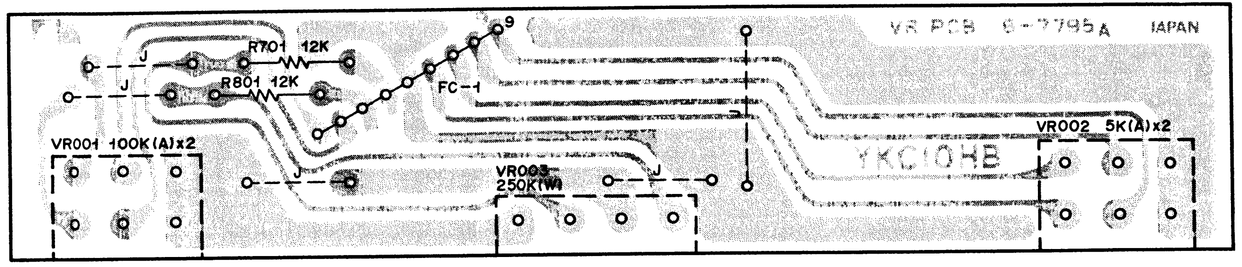

VR PCB B-7795A JAPAN
R701 12K
R801 12K
FC-1
VR001 100K(A)x2
VR002 5K(A)x2
VR003 250K(W)
YKC10HB
J

Fig. 7.2

7.3. DIN-Pin P.C.B. Ass'y

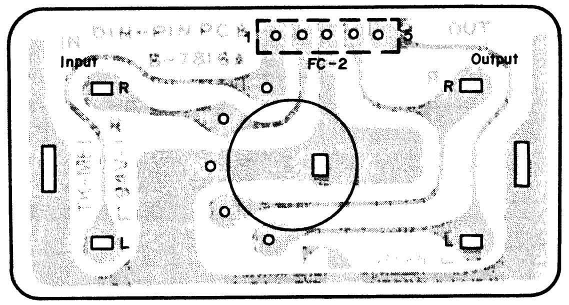

DIN-PIN PCB
Input
Output
FC-2
R
L

Fig. 7.3

7.4. Shut-off P.C.B. Ass'y

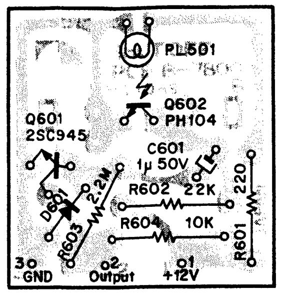

PL501
Q601
2SC945
Q602
PH104
C601
1μ 50V
R602 22K
R604 10K
R601 220
D601
R603 2.2M
3
GND
2
Output
1
+12V

Fig. 7.4.1
Serial No.: A30206790 –

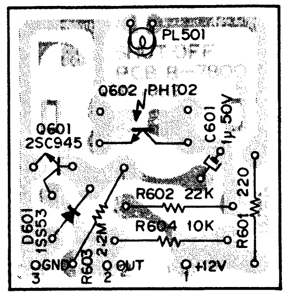

PL501
Q602 PH102
Q601
2SC945
C601 1μ 50V
R602 22K
R604 10K
R601 220
D601 1SS53
R603 2.2M
GND
OUT
+12V

Fig. 7.4.2
Serial Nos.: A30201001 –
A30206789

7.5. Record Cal. P.C.B. Ass'y

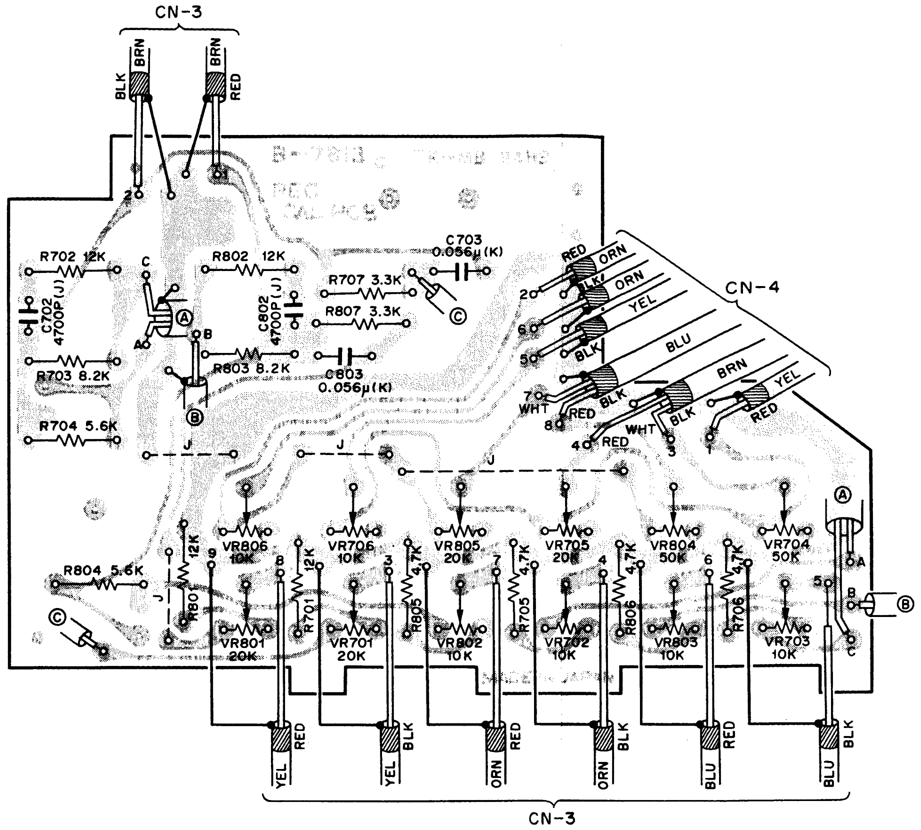

CN-3
BLK
BRN
BRN
RED
CN-4
R702 12K
R802 12K
C702 4700P(J)
C802 4700P(J)
C703 0.056μ(K)
R707 3.3K
R807 3.3K
R703 8.2K
R803 8.2K
C803 0.056μ(K)
R704 5.6K
R804 5.6K
VR806 10K
VR706 10K
VR805 20K
VR705 20K
VR804 50K
VR704 50K
VR801 20K
VR701 20K
VR802 10K
VR702 10K
VR803 10K
VR703 10K
R801
R701
R805
R705
R806
R706
RED
ORN
BLK
YEL
BLU
WHT
A
B
C
J
YEL
RED
YEL
BLK
ORN
RED
ORN
BLK
BLU
RED
BLU
BLK
CN-3

Fig. 7.5

Schematic Ref. No.	Part No.	Description
	BA03976A	**Control Switch P.C.B. Ass'y**
	0B07798A	Control Switch P.C.B.
R605,606 607	0B09049A	Fail Safe Type Resistor 22 RBF25S J
PL601,602 603,604 605,606	0B08552A	Lamp 12V 25mA
SW601,602 603,604 605,606	0B07254A	Switch EVQ-P1R04K
	0B08567B	Lamp Holder (6 pcs.)

Schematic Ref. No.	Part No.	Description
	BA04013A	**Volume P.C.B. Ass'y**
	0B07795A	Volume P.C.B.
VR001	0B07231A	Volume 100K (A) x 2
VR002	0B07259A	Volume 5K (A) x 2
VR003	0B07255A	Volume 250K (W)
R701,801	0B05771A	Carbon Resistor 12K ERD-25T J
FC1	0B05229A	Flat Cable D
	0J03973B	Volume Holder A301 (1 pce.)
	BA04031A	**DIN-Pin P.C.B. Ass'y**
	0B07816A	DIN-Pin Jack P.C.B.
FC2	0B05226A	Flat Cable
	0B08097A	Jack Unit (1 pce.)
	0E00037A	Earch Lug B-5 (1 pce.)

Schematic Ref. No.	Part No.	Description
	BA04076A	**Shut-off Sensor P.C.B. Ass'y** Serial No. A30206790 –
	0B07800B	Shut-off Sensor P.C.B.
Q601	0B01872A	Transistor 2SC945
Q602	0B06228A	Photo Transistor PH104
D601	0B06181A	Silicon Diode 1SS53
R601	0B01933A	Carbon Resistor 220 ERD-25T J
R602	0B05615A	Carbon Resistor 22K ERD-25T J
R603	0B05671A	Carbon Resistor 2.2M ERD-25T J
R604	0B01888A	Carbon Resistor 10K ERD-25T J
C601	0B01405A	Electrolytic Capacitor 1μ 50V
PL501	0B08552A	Lamp 12V 25mA
	BA03975A	**Shut-off Sensor P.C.B. Ass'y** Serial Nos.: A30201001 – A30206789
	0B07800B	Shut-off Sensor P.C.B.
Q601	0B01872A	Transistor 2SC945
Q602	0B06182A	Photo Transistor PH102
D601	0B06181A	Silicon Diode 1SS53
R601	0B01933A	Carbon Resistor 220 ERD-25T J
R602	0B05615A	Carbon Resistor 22K ERD-25T J
R603	0B05671A	Carbon Resistor 2.2M ERD-25T J
R604	0B01888A	Carbon Resistor 10K ERD-25T J
C601	0B01405A	Electrolytic Capacitor 1μ 50V
PL501	0B08552A	Lamp 12V 25mA
	0C08108A	Photo Transistor Terminal (2 pcs.)

Schematic Ref. No.	Part No.	Description
	BA04014A	**Record Calibration P.C.B. Ass'y**
	0B07813C	Record Calibration P.C.B.
VR701,705 801,805	0B07270A	Semi-fixed Volume 20K
VR702,703 706,802 803,806	0B07256A	Semi-fixed Volume 10K
VR704,804	0B07269A	Semi-fixed Volume 50K
R701,702 801,802	0B05771A	Carbon Resistor 12K ERD-25T J
R703,803	0B01856A	Carbon Resistor 8.2K ERD-25T J
R704, 804	0B01887A	Carbon Resistor 5.6K ERD-25T J
R705,706 805,806	0B01846A	Carbon Resistor 4.7K ERD-25T J
R707,807	0B01681A	Carbon Resistor 3.3K ERD-25T J
C702,802	0B05652A	Mylar Capacitor 4700P 50V J
C703,803	0B09274A	Ceramic Capacitor 0.056μ 25V K
CN3	0B08617B	9P-H Connector A302
CN4	0B08616B	8P-H Connector A302

7.6. Main P.C.B. Ass'y

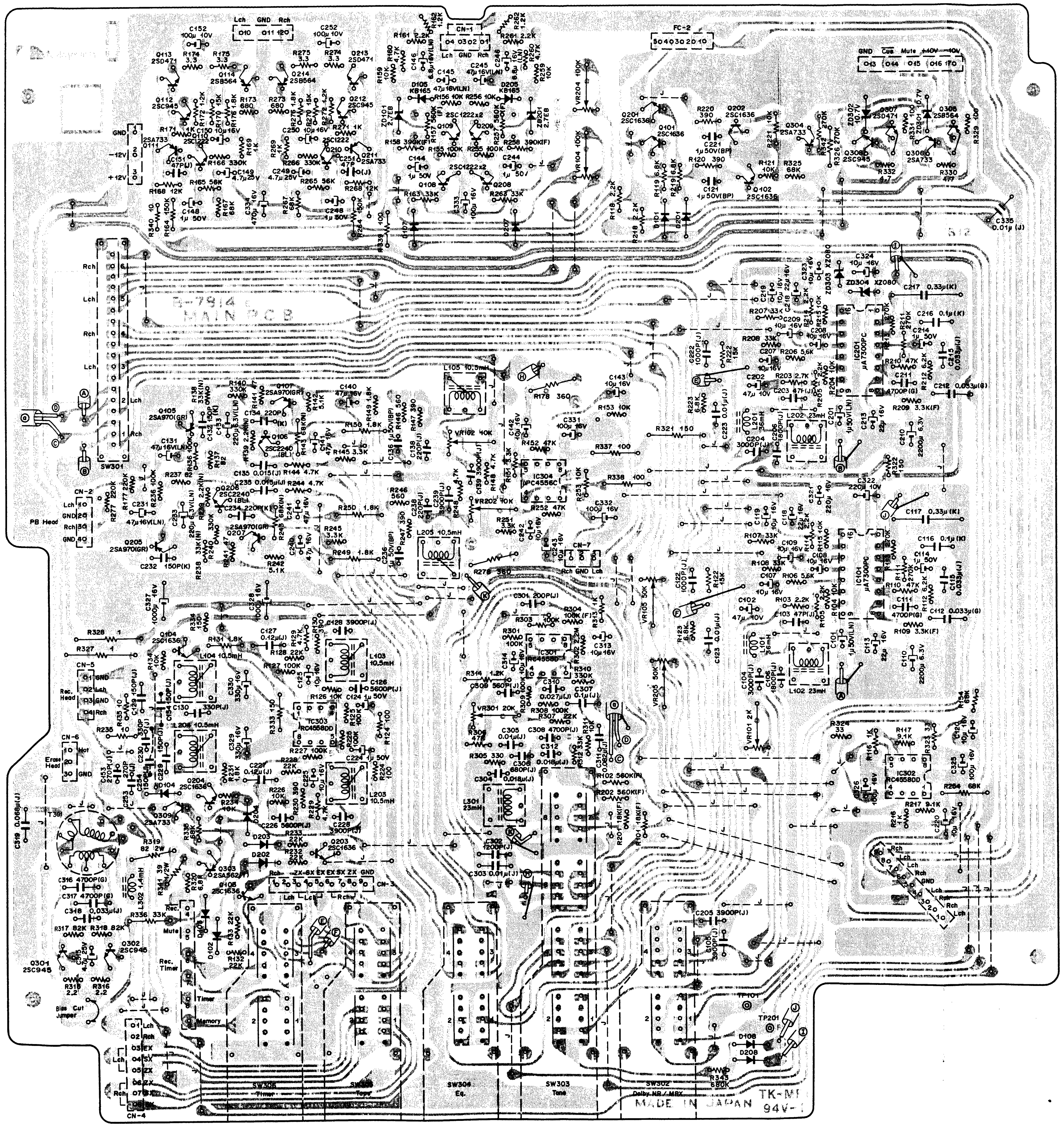

MAIN P.C.B
PB Head
Rec. Head
Erase Head
Bias Cut Jumper
SW301
SW302 Dolby NR / MPX
SW303 Tone
SW304 Eq.
SW305 Tape
SW306 Timer
CN-1
CN-2
CN-4
CN-5
CN-6
CN-7
FC-2
Lch GND Rch
Rch GND Lch
GND Cue Mute +40V −40V
GND
−12V
+12V
Timer
Memory
Rec. Timer
Mute
TP101
TP201
MADE IN JAPAN
TK-M1
94V-

Fig. 7.6.1 Serial No.: A30206060 –

Schematic Ref. No.	Part No.	Description
	BA04015C	**Main P.C.B. Ass'y** Serial No.: A30206060 –
– PB Eq. Amp. –		
Q105,107 205,207	0B06180A	Transistor 2SA970 (GR)
Q106,206	0B06142A	Transistor 2SC2240 (BL)
L105,205	0B00068A	Trap Coil 10.5mH
VR102,202	0B07236A	Semi-fixed Volume 10K
R136,236	0B01920A	Carbon Resistor 100K ERD-25V J
R137,237	0B05503A	Carbon Resistor 82 ERD-25V J
R138,238	0B09239A	Carbon Resistor 33K ERD-25VS J (Noiseless)
R139,239	0B09244A	Carbon Resistor 2.2K ERD-25VS J (Noiseless)
R140,240	0B01921A	Carbon Resistor 330K ERD-25V J
R141,241	0B05569A	Carbon Resistor 47 ERD-25V J
R142,242	0B09186A	Carbon Resistor 5.1K ERD-25V J
R143,243	0B09268A	Carbon Resistor 68K ERD-25VS J (Noiseless)
R144,244 148,248	0B01795A	Carbon Resistor 4.7K ERD-25V J
R145,245	0B01793A	Carbon Resistor 3.3K ERD-25V J
R146,246	0B05678A	Carbon Resistor 560 ERD-25V J
R147,247	0B05688A	Carbon Resistor 390 ERD-25V J
R149	0B01830A	Carbon Resistor 1.8K ERD-25V J
R150,249 250	0B05614A	Carbon Resistor 1.8K ERD-25T J
R177,277	0B05596A	Carbon Resistor 220K ERD-25V J
C131,231	0B09218A	Electrolytic Capacitor 47μ 16V (LN)
C132,232	0B09281A	Ceramic Capacitor 150P 50V K
C133,233	0B09151A	Electrolytic Capacitor 220μ 6.3V (LN)
C134,234	0B09283A	Ceramic Capacitor 220P 50V K
C135,235	0B05557A	Mylar Capacitor 0.015μ 50V J
C136,236	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C138,238	0B09247A	Mica Capacitor 220P 50V J
C139,239	0B01804A	Mylar Capacitor 3900P 50V J
C140,141 240,241	0B01403A	Electrolytic Capacitor 47μ 16V
– Line Amp. –		
IC302	0B06146A	IC RC4558DD
Q101,102 201,202	0B06070A	Transistor 2SC1636
Q304,306	0B06013A	Transistor 2SA733
Q305	0B06069A	Transistor 2SB564
Q307	0B06066A	Transistor 2SD471
Q308	0B01872A	Transistor 2SC945
D101,201	0B06181A	Silicon Diode 1SS53
ZD301,302	0B06199A	Zener Diode 10 7V
R116,216	0B01781A	Carbon Resistor 1K ERD-25V J
R117,217	0B09184A	Carbon Resistor 9.1K ERD-25V J
R118,218	0B05566A	Carbon Resistor 2.2K ERD-25V J
R119,219	0B01877A	Carbon Resistor 6.8K ERD-25V J
R120,220	0B05688A	Carbon Resistor 390 ERD-25V J
R121,221	0B01833A	Carbon Resistor 10K ERD-25V J
R323,324	0B09210A	Fail Safe Type Resistor 33 RDF25S J
R325	0B01902A	Carbon Resistor 68K ERD-25V J
R326,342	0B05600A	Carbon Resistor 270K ERD-25V J
R327,328	0B09214A	Fail Safe Type Resistor 1 RDF25S J

Schematic Ref. No.	Part No.	Description
R329,331	0B09215A	Fail Safe Type Resistor 100 RDF25S J
R330,332	0B09243A	Fail Safe Type Resistor 4.7 RDF50S J
C120,220	0B01412A	Electrolytic Capacitor 10μ 16V
C121,221	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C325,326	0B01400A	Electrolytic Capacitor 100μ 16V
C327,328	0B01397A	Electrolytic Capacitor 1000μ 16V
C335	0B05681A	Mylar Capacitor 0.01μ 50V J
		— Tone Osc. —
IC301	0B06124B	IC RC4558D
L301	0B03563A	19K Coil 23mH
VR301	0B09093A	Semi-fixed Volume 20K
R101,201	0B09205A	Metal Film Resistor 18K SN15K2E F
R102,202	0B09206A	Metal Film Resistor 560K SN15K2E F
R301,303 308,309	0B01920A	Carbon Resistor 100K ERD-25V J
R302	0B05672A	Carbon Resistor 2.2M ERD-25V J
R304	0B09269A	Metal Film Resistor 100K ERD-25VK F
R305	0B01789A	Carbon Resistor 330 ERD-25V J
R306	0B05562A	Carbon Resistor 47K ERD-25V J
R307	0B05661A	Carbon Resistor 22K ERD-25V J
R310	0B01921A	Carbon Resistor 330K ERD-25V J
R311	0B01833A	Carbon Resistor 10K ERD-25V J
R312	0B01879A	Carbon Resistor 33K ERD-25V J
R313	0B01857A	Carbon Resistor 1K ERD-25T J
R314	0B05623A	Carbon Resistor 1.2K ERD-25T J
C301	0B09275A	Mica Capacitor 200P 50V J
C302	0B05687A	Mylar Capacitor 1200P 50V J
C303,305	0B05681A	Mylar Capacitor 0.01μ 50V J
C304,312	0B05832A	Mylar Capacitor 0.018μ 50V J
C306	0B09235A	PP Capacitor 680P 100V J
C307	0B01780A	Mylar Capacitor 0.1μ 50V J
C308	0B05652A	Mylar Capacitor 4700P 50V J
C309	0B09323A	PP Capacitor 560P 100V J
C310	0B09045A	Mylar Capacitor 0.027μ 50V J
C311	0B05685A	Mylar Capacitor 0.082μ 50V J
C313,314	0B01412A	Electrolytic Capacitor 10μ 16V
		— Rec. Amp. —
IC303	0B06146A	IC RC4558DD
Q103,104 203,204	0B06070A	Transistor 2SC1636
Q309	0B06013A	Transistor 2SA733
D102,103 104,202 203,204	0B06181A	Silicon Diode 1SS53
L103,104 203,204	0B00068A	Trap Coil 10.5mH
R122,222	0B05591A	Carbon Resistor 15K ERD-25V J
R123,223	0B01877A	Carbon Resistor 6.8K ERD-25V J
R124,224	0B05558A	Carbon Resistor 100 ERD-25V J
R125,127 225,227	0B01920A	Carbon Resistor 100K ERD-25V J
R126,134 226,234	0B01833A	Carbon Resistor 10K ERD-25V J
R128,132 133,228 232,233	0B05661A	Carbon Resistor 22K ERD-25V J
R129,229	0B01795A	Carbon Resistor 4.7K ERD-25V J
R130,230	0B05688A	Carbon Resistor 390 ERD-25V J
R131,231	0B01830A	Carbon Resistor 1.8K ERD-25V J
R135,235	0B05663A	Carbon Resistor 10 ERD-25V J
R333,334	0B09213A	Fail Safe Type Resistor 150 RDF25S J
R335	0B01902A	Carbon Resistor 68K ERD-25V J
R336	0B01879A	Carbon Resistor 33K ERD-25V J
C122,222	0B05550A	Mylar Capacitor 1000P 50V J
C123,223	0B05681A	Mylar Capacitor 0.01μ 50V J
C124,224	0B01405A	Electrolytic Capacitor 1μ 50V
C125,225	0B01412A	Electrolytic Capacitor 10μ 16V
C126,226	0B05659A	Mylar Capacitor 5600P 50V J
C127,227	0B05909A	Mylar Capacitor 0.12μ 50V J
C128,228	0B01804A	Mylar Capacitor 3900P 50V J
C129,229 154,254	0B09246A	Mica Capacitor 150P 50V J
C130,230	0B09322A	PP Capacitor 330P 100V J
C329,330	0B01502A	Electrolytic Capacitor 300μ 16V
		— Bias Osc. —
Q301,302	0B01872A	Transistor 2SC945
Q303	0B06202A	Transistor 2SA562 (Y)
T301	0B06613A	Osc. Coil
L302	0B03861A	Inductor 1.4mH
R315,316	0B09212A	Fail Safe Type Resistor 2.2 RDF25S J
R317,318	0B01564A	Carbon Resistor 82K ERD-25V J
R319	0B09295A	Fail Safe Type Resistor 82 RSF-2B J
R320	0B01877A	Carbon Resistor 6.8K ERD-25V J
R341	0B09296A	Fail Safe Type Resistor 39 RSF-½B J
C153,253	0B09284A	Ceramic Capacitor 270P 50V J
C315	0B01402A	Electrolytic Capacitor 4.7μ 25V
C316,317	0B09191A	PP Capacitor 4700P 100V G
C318	0B05583A	Mylar Capacitor 0.033μ 50V J
C319	0B09254A	PP Capacitor 0.068μ 100V J
		— Meter Amp. —
Q108,109 208,209	0B06062A	Transistor 2SC1222
D105,205	0B06007A	Silicon Varistor KB-165
D107,207	0B06181A	Silicon Diode 1SS53
ZD101,201	0B06191A	Zener Diode 2.7EB 2.7V
VR104,204	0B03832A	Semi-fixed Volume 100K
R154,254	0B01902A	Carbon Resistor 68K ERD-25V J
R155,255	0B01920A	Carbon Resistor 100K ERD-25V J
R156,159 256,259	0B01833A	Carbon Resistor 10K ERD-25V J
R157,257	0B09206A	Metal Film Resistor 560K SN15K2E F
R158,258	0B09207A	Metal Film Resistor 390K SN15K2E F
R160,260	0B01795A	Carbon Resistor 4.7K ERD-25V J
R161,261	0B05566A	Carbon Resistor 2.2K ERD-25V J
R162,262	0B05565A	Carbon Resistor 1.2K ERD-25V J
R163,263	0B01879A	Carbon Resistor 33K ERD-25V J
R339	0B09215A	Fail Safe Type Resistor 100 RDF25S J
C144, 244	0B01405A	Electrolytic Capacitor 1μ 50V
C145,245	0B09218A	Electrolytic Capacitor 47μ 16V (LN)
C146,246	0B09219A	Electrolytic Capacitor 6.8μ 16V (LN)
C333	0B01400A	Electrolytic Capacitor 100μ 16V
		— Headphone Amp. —
Q110,210	0B06062A	Transistor 2SC1222
Q111,211	0B06013A	Transistor 2SA733
Q112,212	0B01872A	Transistor 2SC945
Q113,213	0B06066A	Transistor 2SD471
Q114,214	0B06069A	Transistor 2SB564
R164,264	0B05593A	Carbon Resistor 150K ERD-25V J
R165,265	0B05563A	Carbon Resistor 56K ERD-25V J
R166,266	0B01921A	Carbon Resistor 330K ERD-25V J
R167,267	0B01902A	Carbon Resistor 68K ERD-25V J
R168,268	0B05650A	Carbon Resistor 12K ERD-25V J
R169,171 269,271	0B01781A	Carbon Resistor 1K ERD-25V J
R170,270	0B05591A	Carbon Resistor 15K ERD-25V J
R172,272	0B05565A	Carbon Resistor 1.2K ERD-25V J
R173,273	0B05559A	Carbon Resistor 680 ERD-25V J
R174,175 274,275	0B05779A	Carbon Resistor 3.3 ERD-25V J
R176,276	0B01830A	Carbon Resistor 1.8K ERD-25V J
R340	0B09216A	Fail Safe Type Resistor 10 RDF25S J
C148,248	0B01405A	Electrolytic Capacitor 1μ 50V
C149,249	0B01402A	Electrolytic Capacitor 4.7μ 25V
C150,250	0B01412A	Electrolytic Capacitor 10μ 16V
C151,251	0B09280A	Ceramic Capacitor 47P 50V J
C152,252	0B05885A	Electrolytic Capacitor 100μ 10V
C334	0B01392A	Electrolytic Capacitor 470μ 16V
		— Monitor Amp. —
IC304	0B06234A	IC μPC4556C
VR105,205	0B07237A	Semi-fixed Volume 50K
R151,251	0B01793A	Carbon Resistor 3.3K ERD-25V J
R152,252	0B05562A	Carbon Resistor 47K ERD-25V J
R153,253	0B01833A	Carbon Resistor 10K ERD-25V J
R178,278	0B09326A	Carbon Resistor 360 ERD-25T J
R337,338	0B09215A	Fail Safe Type Resistor 100 RDF25S J
C142,143 242,243	0B01412A	Electrolytic Capacitor 10μ 16V
C331,332	0B01400A	Electrolytic Capacitor 100μ 16V
		— Dolby NR —
IC101,201	0B06175A	IC μA7300PC
D108,208	0B06181A	Silicon Diode 1SS53
ZD303,304	0B06090A	Zener Diode ZX080
L101,201	0B03919A	Inductor 36mH
L102,202	0B03563A	19K Coil 23mH
VR101	0B09106A	Semi-fixed Volume 2K
R103,105 114,205 214	0B05566A	Carbon Resistor 2.2K ERD-25V J
R104,115 204,215	0B01833A	Carbon Resistor 10K ERD-25V J
R106,206	0B05673A	Carbon Resistor 5.6K ERD-25V J
R107,108 207,208	0B01879A	Carbon Resistor 33K ERD-25V J
R109,209	0B09208A	Metal Film Resistor 3.3K SN15K2E F
R110,210	0B05562A	Carbon Resistor 47K ERD-25V J
R111,113 211,213	0B05600A	Carbon Resistor 270K ERD-25V J
R112,212	0B05823A	Carbon Resistor 6.2K ERD-25V J
R203	0B01782A	Carbon Resistor 2.7K ERD-25V J
R321,322	0B09213A	Fail Safe Type Resistor 150 RDF25S J
R343	0B05597A	Carbon Resistor 680K ERD-25V J
C101,201	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C102,202	0B01836A	Electrolytic Capacitor 47μ 10V
C103,203	0B09242A	Mica Capacitor 47P 50V J
C104,204	0B09262A	PP Capacitor 3000P 50V J
C105,205	0B01804A	Mylar Capacitor 3900P 50V J
C106,206	0B01913A	Mylar Capacitor 1800P 50V J
C107,108 109,119 207,208 209,219 323,324	0B01412A	Electrolytic Capacitor 10μ 16V
C110,210	0B09257A	Electrolytic Capacitor 2200μ 6.3V
C111,211	0B09191A	PP Capacitor 4700P 100V G
C112,212	0B09240A	PP Capacitor 0.033μ 100V G
C113,118 213,218	0B01862A	Electrolytic Capacitor 22μ 16V
C114,214	0B01405A	Electrolytic Capacitor 1μ 50V
C115,215	0B05583A	Mylar Capacitor 0.033μ 50V J
C116,216	0B01603A	Mylar Capacitor 0.1μ 50V K
C117,217	0B01602A	Mylar Capacitor 0.33μ 50V K
C321,322	0B01398A	Electrolytic Capacitor 220μ 16V
		— Miscellaneous —
	0B07814E	Main P.C.B. A302
SW301	0B07267A	Record Switch A302
SW302,305	0B07264A	Rotary Slide Switch C
SW303	0B07266A	Rotary Slide Switch E
SW304	0B07262A	Rotary Slide Switch A
SW306	0B07263A	Rotary Slide Switch B
TP101,201	0B03924A	Gate Pin
	0C08569C	Record Wire Holder (1 pce.)
	0B08375A	4P-S Post (1 pce.)
	0B08185A	3P-T Post (2 pcs.)
	0B08236A	4P-T Post (2 pcs.)
	0B08334A	8P-T Post (1 pce.)
	0B08614A	9P-T Post (1 pce.)
	0B08542A	Wrapping Pin 1P (1 pce.)
	0B08544A	Wrapping Pin 3P (2 pcs.)
	0B08545A	Wrapping Pin 4P (1 pce.)
	0B08547A	Wrapping Pin 6P (1 pce.)
	0C08570A	Record Spring Holder (1 pce.)
	0C08144C	Record Spring (1 pce.)
	0E00037A	Earth Lug B-5 (1 pce.)
	0E00172A	Washer Toothed Lock 3mm (1 pce.)
	0E00788A	BT Screw M2x8 Philips Pan Head (1 pce.)
	0E00831A	BT Screw M3x10 Philips Pan Head (1 pce.)

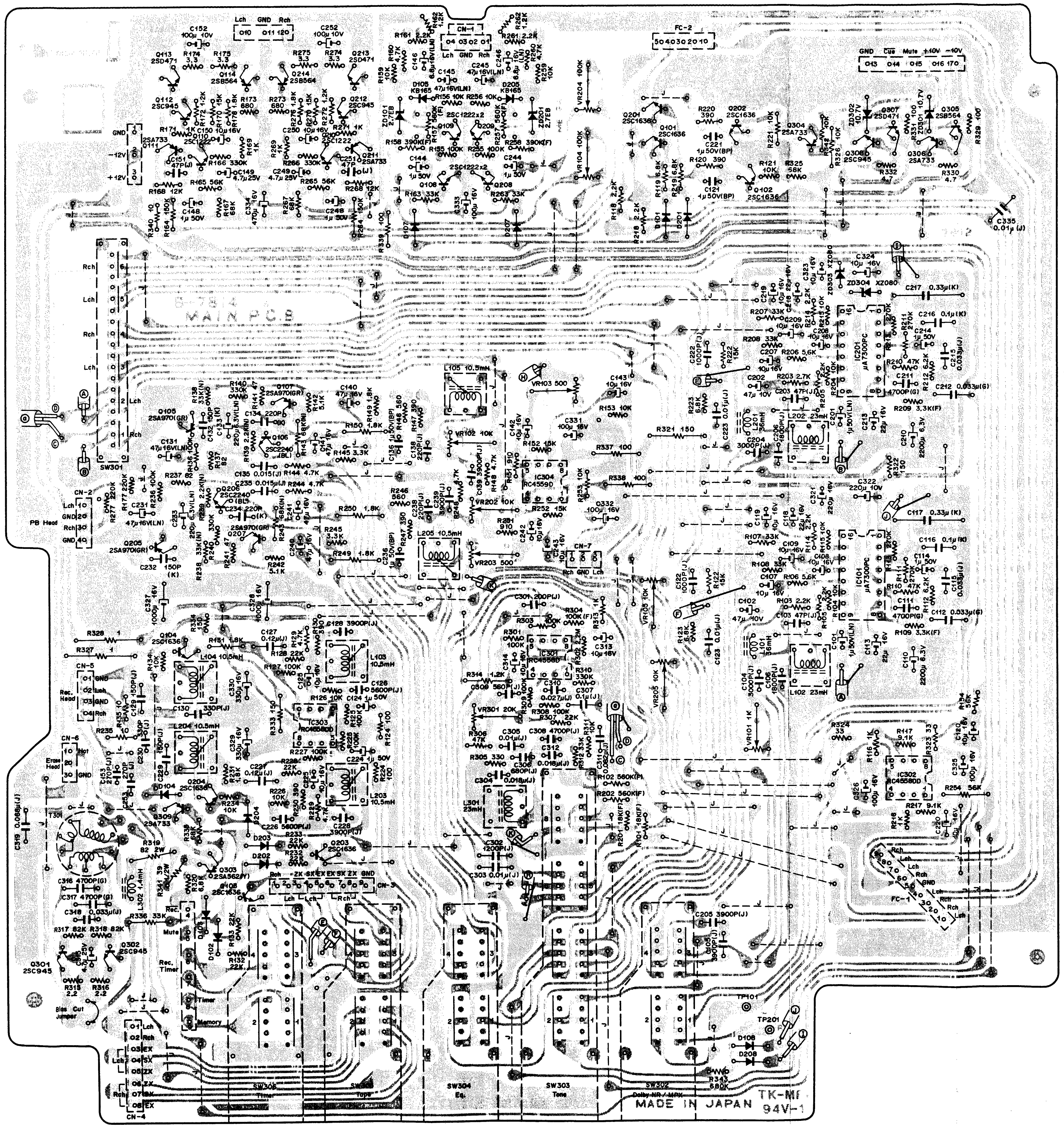

B-7814
MAIN P.C.B.
Lch GND Rch
FC-2
GND Cue Mute +10V -10V
-12V
+12V
GND
Rch
Lch
SW301
CN-2
PB Head
CN-5
Rec. Head
CN-6
Erase Head
CN-7
CN-4
FC-1
Bias Cut Jumper
Mute
Rec.
Rec. Timer
Timer
Memory
SW305 Timer
SW306 Tape
SW304 Eq.
SW303 Tone
SW302 Dolby NR / MPX
TP101
TP201
MADE IN JAPAN
TK-M
94V-1

Fig. 7.6.2 Serial Nos.: A30201001 — A30206059

Schematic Ref. No.	Part No.	Description
	BA04015B	Main P.C.B. Ass'y Serial Nos.: A30201001 — A30206059
	– PB Eq. Amp. –	
Q105,107 205,207	0B06180A	Transistor 2SA970 (GR)
Q106,206	0B06142A	Transistor 2SC2240 (BL)
L105,205	0B00068A	Trap Coil 10.5mH
VR102,202	0B07236A	Semi-fixed Volume 10K
R136,236	0B01920A	Carbon Resistor 100K ERD-25V J
R137,237	0B05503A	Carbon Resistor 82 ERD-25V J
R138,238	0B09239A	Carbon Resistor 33K ERD-25VS J (Noiseless)
R139,239	0B09244A	Carbon Resistor 2.2K ERD-25VS J (Noiseless)
R140,240	0B01921A	Carbon Resistor 330K ERD-25V J
R141,241	0B05569A	Carbon Resistor 47 ERD-25V J
R142,242	0B09186A	Carbon Resistor 5.1K ERD-25V J
R143,243	0B09268A	Carbon Resistor 68K ERD-25VS J (Noiseless)
R144,244 148,248	0B01795A	Carbon Resistor 4.7K ERD-25V J
R145,245	0B01793A	Carbon Resistor 3.3K ERD-25V J
R146,246	0B05678A	Carbon Resistor 560 ERD-25V J
R147,247	0B05688A	Carbon Resistor 390 ERD-25V J
R149	0B01830A	Carbon Resistor 1.8K ERD-25V J
R150,249 250	0B05614A	Carbon Resistor 1.8K ERD-25T J
R177,277	0B05596A	Carbon Resistor 220K ERD-25V J
C131,231	0B09218A	Electrolytic Capacitor 47μ 16V (LN)
C132,232	0B09281A	Ceramic Capacitor 150P 50V K
C133,233	0B09151A	Electrolytic Capacitor 220μ 6.3V (LN)
C134,234	0B09283A	Ceramic Capacitor 220P 50V K
C135,235	0B05557A	Mylar Capacitor 0.015μ 50V J
C136,236	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C138,238	0B09247A	Mica Capacitor 220P 50V J
C139,239	0B01804A	Mylar Capacitor 3900P 50V J
C140,141 240,241	0B01403A	Electrolytic Capacitor 47μ 16V
	– Line Amp. –	
IC302	0B06146A	IC RC4558DD
Q101,102 201,202	0B06070A	Transistor 2SC1636
Q304,306	0B06013A	Transistor 2SA733
Q305	0B06069A	Transistor 2SB564
Q307	0B06066A	Transistor 2SD471
Q308	0B01872A	Transistor 2SC945
D101,201	0B06181A	Silicon Diode 1SS53
ZD301,302	0B06199A	Zener Diode 10.7V
R116,216	0B01781A	Carbon Resistor 1K ERD-25V J
R117,217	0B09184A	Carbon Resistor 9.1K ERD-25V J
R118,218	0B05566A	Carbon Resistor 2.2K ERD-25V J
R119,219	0B01877A	Carbon Resistor 6.8K ERD-25V J
R120,220	0B05688A	Carbon Resistor 390 ERD-25V J
R121,221	0B01833A	Carbon Resistor 10K ERD-25V J
R323,324	0B09210A	Fail Safe Type Resistor 33 RDF25S J
R325	0B01902A	Carbon Resistor 68K ERD-25V J
R326,342	0B05600A	Carbon Resistor 270K ERD-25V J
R327,328	0B09214A	Fail Safe Type Resistor 1 RDF25S J

Schematic Ref. No.	Part No.	Description
R329,331	0B09215A	Fail Safe Type Resistor 100 RDF25S J
R330,332	0B09243A	Fail Safe Type Resistor 4.7 RDF50S J
C120,220	0B01412A	Electrolytic Capacitor 10μ 16V
C121,221	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C325,326	0B01400A	Electrolytic Capacitor 100μ 16V
C327,328	0B01397A	Electrolytic Capacitor 1000μ 16V
C335	0B05681A	Mylar Capacitor 0.01μ 50V J
	— Tone Osc. —	
IC301	0B06124B	IC RC4558D
L301	0B03563A	19K Coil 23mH
VR301	0B09093A	Semi-fixed Volume 20K
R101,201	0B09205A	Metal Film Resistor 18K SN15K2E F
R102,202	0B09206A	Metal Film Resistor 560K SN15K2E F
R301,303 308,309	0B01920A	Carbon Resistor 100K ERD-25V J
R302	0B05672A	Carbon Resistor 2.2M ERD-25V J
R304	0B09269A	Metal Film Resistor100K ERD-25VK F
R305	0B01789A	Carbon Resistor 330 ERD-25V J
R306	0B05562A	Carbon Resistor 47K ERD-25V J
R307	0B05661A	Carbon Resistor 22K ERD-25V J
R310	0B01921A	Carbon Resistor 330K ERD-25V J
R311	0B01833A	Carbon Resistor 10K ERD-25V J
R312	0B01879A	Carbon Resistor 33K ERD-25V J
R313	0B01857A	Carbon Resistor 1K ERD-25T J
R314	0B05623A	Carbon Resistor 1.2K ERD-25T J
C301	0B09275A	Mica Capacitor 200P 50V J
C302	0B05687A	Mylar Capacitor 1200P 50V J
C303,305	0B05681A	Mylar Capacitor 0.01μ 50V J
C304,312	0B05832A	Mylar Capacitor 0.018μ 50V J
C306	0B09235A	PP Capacitor 680P 100V J
C307	0B01780A	Mylar Capacitor 0.1μ 50V J
C308	0B05652A	Mylar Capacitor 4700P 50V J
C309	0B09323A	PP Capacitor 560P 100V J
C310	0B09045A	Mylar Capacitor 0.027μ 50V J
C311	0B05685A	Mylar Capacitor 0.082μ 50V J
C313,314	0B01412A	Electrolytic Capacitor 10μ 16V
	— Rec. Amp. —	
IC303	0B06146A	IC RC4558DD
Q103,104 203,204	0B06070A	Transistor 2SC1636
Q309	0B06013A	Transistor 2SA733
D102,103 104,202 203,204	0B06181A	Silicon Diode 1SS53
L103,104 203,204	0B00068A	Trap Coil 10.5mH
R122,222	0B05591A	Carbon Resistor 15K ERD-25V J
R123,223	0B01877A	Carbon Resistor 6.8K ERD-25V J
R124,224	0B05558A	Carbon Resistor 100 ERD-25V J
R125,127 225,227	0B01920A	Carbon Resistor 100K ERD-25V J
R126,134 226,234	0B01833A	Carbon Resistor 10K ERD-25V J
R128,132 133,228 232,233	0B05661A	Carbon Resistor 22K ERD-25V J
R129,229	0B01795A	Carbon Resistor 4.7K ERD-25V J
R130,230	0B05688A	Carbon Resistor 390 ERD-25V J
R131,231	0B01830A	Carbon Resistor 1.8K ERD-25V J
R135,235	0B05663A	Carbon Resistor 10 ERD-25V J
R333,334	0B09213A	Fail Safe Type Resistor 150 RDF25S J
R335	0B01902A	Carbon Resistor 68K ERD-25V J
R336	0B01879A	Carbon Resistor 33K ERD-25V J
C122,222	0B05550A	Mylar Capacitor 1000P 50V J
C123,223	0B05681A	Mylar Capacitor 0.01μ 50V J
C124,224	0B01405A	Electrolytic Capacitor 1μ 50V
C125,225	0B01412A	Electrolytic Capacitor 10μ 16V
C126,226	0B05659A	Mylar Capacitor 5600P 50V J
C127,227	0B05909A	Mylar Capacitor 0.12μ 50V J
C128,228	0B01804A	Mylar Capacitor 3900P 50V J
C129,229	0B09246A	Mica Capacitor 150P 50V J
C130,230	0B09322A	PP Capacitor 330P 100V J
C329,330	0B01502A	Electrolytic Capacitor 330μ 16V
	— Bias Osc. —	
Q301,302	0B01872A	Transistor 2SC945
Q303	0B06202A	Transistor 2SA562(Y)
T301	0B06613A	Osc. Coil
L302	0B03861A	Inductor 1.4mH
R315,316	0B09212A	Fail Safe Type Resistor 2.2RDF25S J
R317,318	0B01564A	Carbon Resistor 82K ERD-25V J
R319	0B09294A	Fail Safe Type Resistor 82 RSF-2B J
R320	0B01877A	Carbon Resistor 6.8K ERD-25V J
R341	0B09296A	Fail Safe Type Resistor 39 RSF-1/2B J
C153,253	0B09284A	Ceramic Capacitor 270P 50V J
C315	0B01402A	Electrolytic Capacitor 4.7μ 25V
C316,317	0B09191A	PP Capacitor 4700P 100V G
C318	0B05583A	Mylar Capacitor 0.033μ 50V J
C319	0B09254A	PP Capacitor 0.068μ 100V J
	— Meter Amp. —	
Q108,109 208,209	0B06062A	Transistor 2SC1222
D105,205	0B06007A	Silicon Varistor KB-165
D107,207	0B06181A	Silicon Diode 1SS53
ZD101,201	0B06191A	Zener Diode 2.7EB 2.7V
VR104,204	0B03832A	Semi-fixed Volume 100K
R154,254	0B05563A	Carbon Resistor 56K ERD-25V J
R155,255	0B01920A	Carbon Resistor 100K ERD-25V J
R156,159 256,259	0B01833A	Carbon Resistor 10K ERD-25V J
R157,257	0B09206A	Metal Film Resistor 560K SN15K2E F
R158,258	0B09207A	Metal Film Resistor 390K SN15K2E F
R160,260	0B01795A	Carbon Resistor 4.7K ERD-25V J
R161,261	0B05566A	Carbon Resistor 2.2K ERD-25V J
R162,262	0B05565A	Carbon Resistor 1.2K ERD-25V J
R163,263	0B01879A	Carbon Resistor 33K ERD-25V J
R339	0B09215A	Fail Safe Type Resistor 100 RDF25S J
C144,244	0B01405A	Electrolytic Capacitor 1μ 50V
C145,245	0B09218A	Electrolytic Capacitor 47μ 16V (LN)
C146,246	0B09219A	Electrolytic Capacitor 6.8μ 16V (LN)
C333	0B01400A	Electrolytic Capacitor 100μ 16V
	— Headphone Amp. —	
Q110,210	0B06062A	Transistor 2SC1222
Q111,211	0B06013A	Transistor 2SA733
Q112,212	0B01872A	Transistor 2SA945
Q113,213	0B06066A	Transistor 2SD471
Q114,214	0B06069A	Transistor 2SB564
R164,264	0B05593A	Carbon Resistor 150K ERD-25V J
R165,265	0B05563A	Carbon Resistor 56K ERD-25V J
R166,266	0B01921A	Carbon Resistor 330K ERD-25V J
R167,267	0B01902A	Carbon Resistor 68K ERD-25V J
R168,268	0B05650A	Carbon Resistor 12K ERD-25V J
R169,171 269,271	0B01781A	Carbon Resistor 1K ERD-25V J
R170,270	0B05591A	Carbon Resistor 15K ERD-25V J
R172,272	0B05565A	Carbon Resistor 1.2K ERD-25V J
R173,273	0B05559A	Carbon Resistor 680 ERD-25V J
R174,175 274,275	0B05779A	Carbon Resistor 3.3 ERD-25V J
R176,276	0B01830A	Carbon Resistor 1.8K ERD-25V J
R340	0B09216A	Fail Safe Type Resistor 10 RDF25S J
C148,248	0B01405A	Electrolytic Capacitor 1μ 50V
C149,249	0B01402A	Electrolytic Capacitor 4.7μ 25V
C150,250	0B01412A	Electrolytic Capacitor 10μ 16V
C151,251	0B09280A	Ceramic Capacitor 47P 50V J
C152,252	0B05885A	Electrolytic Capacitor 100μ 10V
C334	0B01392A	Electrolytic Capacitor 470μ 16V
	— Monitor Amp. —	
IC304	0B06127A	IC RC4559D
VR103,203	0B07159A	Semi-fixed Volume 500
VR105,205	0B07236A	Semi-fixed Volume 10K
R151,251	0B09272A	Carbon Resistor 910 ERD-25V J
R152,252	0B05591A	Carbon Resistor 15K ERD-25V J
R153,253	0B01833A	Carbon Resistor 10K ERD-25V J
R337,338	0B09215A	Fail Safe Type Resistor 100 RDF25S J
C142,143 242,243	0B01412A	Electrolytic Capacitor 10μ 16V
C331,332	0B01400A	Electrolytic Capacitor 100μ 16V
	— Dolby NR —	
IC101,201	0B06175A	IC μA7300PC
D108,208	0B06181A	Silicon Diode 1SS53
ZD303,304	0B06090A	Zener Diode ZX080
L101,201	0B03919A	Inductor 36mH
L102,202	0B03563A	19K Coil 23mH
VR101	0B07178A	Semi-fixed Volume 1K
R103,105 114,205 214	0B05566A	Carbon Resistor 2.2K ERD-25V J
R104,115 204,215	0B01833A	Carbon Resistor 10K ERD-25V J
R106,206	0B05673A	Carbon Resistor 5.6K ERD-25V J
R107,108 207,208	0B01879A	Carbon Resistor 33K ERD-25V J
R109,209	0B09208A	Metal Film Resistor 3.3K SN15K2E F
R110,210	0B05562A	Carbon Resistor 47K ERD-25V J
R111,113 211,213	0B05600A	Carbon Resistor 270K ERD-25V J
R112,212	0B05823A	Carbon Resistor 6.2K ERD-25V J
R203	0B01782A	Carbon Resistor 2.7K ERD-25V J
R321,322	0B09213A	Fail Safe Type Resistor 150 RDF25S J
R343	0B05597A	Carbon Resistor 680K ERD-25V J
C101,201	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C102,202	0B01836A	Electrolytic Capacitor 47μ 10V
C103,203	0B09242A	Mica Capacitor 47P 50V J
C104,204	0B09262A	PP Capacitor 3000P 50V J
C105,205	0B01804A	Mylar Capacitor 3900P 50V J
C106,206	0B01913A	Mylar Capacitor 1800P 50V J
C107,108 109,119 207,208 209,219 323,324	0B01412A	Electrolytic Capacitor 10μ 16V
C110,210	0B09257A	Electrolytic Capacitor 2200μ 6.3V
C111,211	0B09191A	PP Capacitor 4700P 100V G
C112,212	0B09240A	PP Capacitor 0.033μ 100V G
C113,118 213,218	0B01862A	Electrolytic Capacitor 22μ 16V
C114,214	0B01405A	Electrolytic Capacitor 1μ 50V
C115,215	0B05583A	Mylar Capacitor 0.033μ 50V J
C116,216	0B01603A	Mylar Capacitor 0.1μ 50V K
C117,217	0B01602A	Mylar Capacitor 0.33μ 50V K
C321,322	0B01398A	Electrolytic Capacitor 220μ 16V
	— Miscellaneous —	
	0B07814B	Main P.C.B. A302
SW301	0B07267A	Record Switch A302
SW302,305	0B07264A	Rotary Slide Switch C
SW303	0B07266A	Rotary Slide Switch E
SW304	0B07262A	Rotary Slide Switch A
SW306	0B07263A	Rotary Slide Switch B
TP101,201	0B03924A	Gate Pin
	0C08569C	Record Wire Holder (1 pce.)
	0B08375A	4P-S Post (1 pce.)
	0B08185A	3P-T Post (2 pcs.)
	0B08236A	4P-T Post (2 pcs.)
	0B08334A	8P-T Post (1 pce.)
	0B08614A	9P-T Post (1 pce.)
	0B08542A	Wrapping Pin 1P (1 pce.)
	0B08544A	Wrapping Pin 3P (2 pcs.)
	0B08545A	Wrapping Pin 4P (1 pce.)
	0B08547A	Wrapping Pin 6P (1 pce.)
	0C08570A	Record Spring Holder (1 pce.)
	0C08144C	Record Spring (1 pce.)
	0E00037A	Earth Lug B-5 (1 pce.)
	0E00172A	Washer Toothed Lock 3mm (1 pce.)
	0E00788A	BT Screw M2x8 Philips Pan Head (1 pce.)
	0E00831A	BT Screw M3x10 Philips Pan Head (1 pce.)

7.7. Logic P.C.B. Ass'y

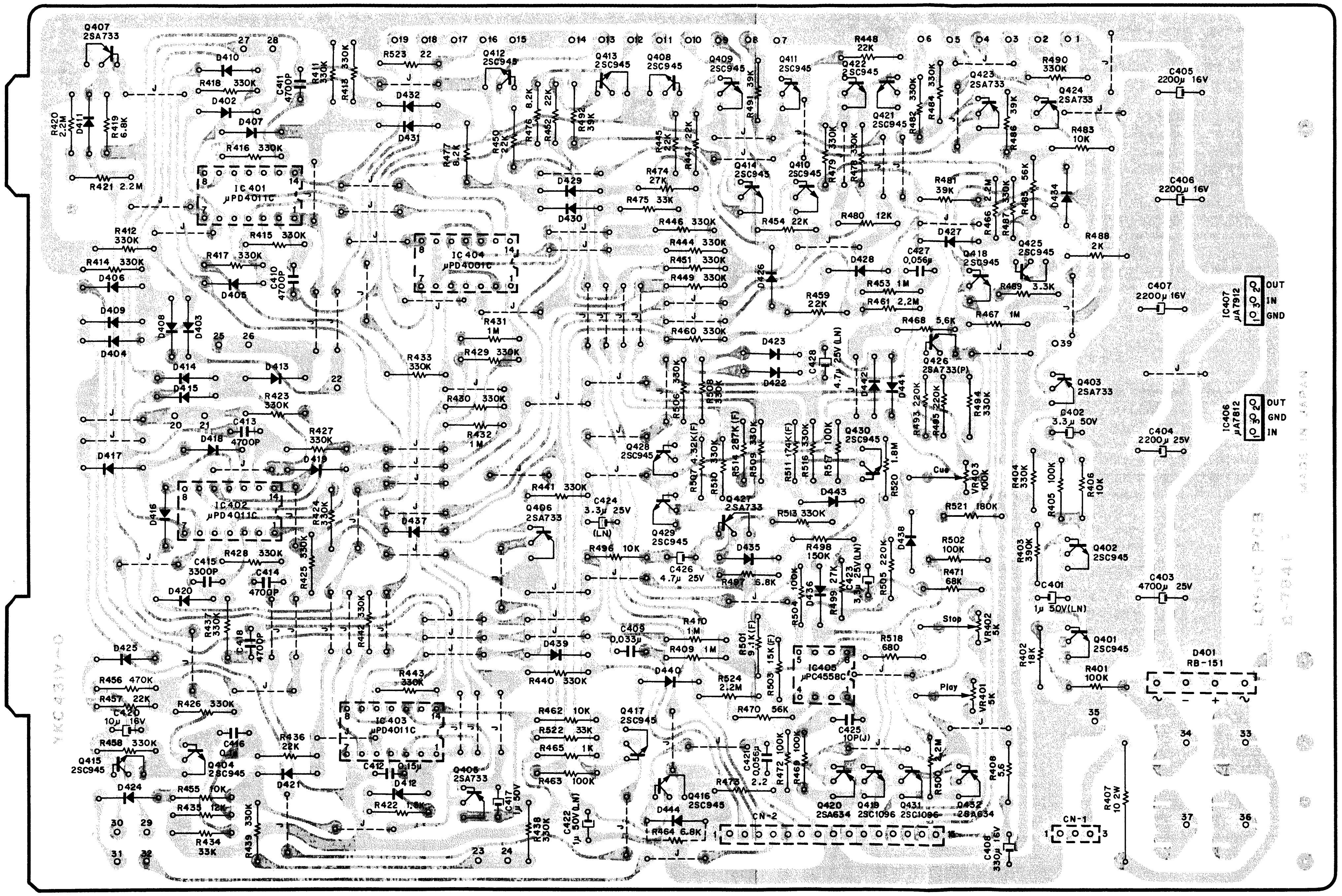

Q407 2SA733
D410
R418 330K
D402
D407
R420 2.2M
D411
R419 6.8K
R421 2.2M
R416 330K
IC401 μPD4011C
C411 4700P
R411 330K
R413 330K
R523 22
Q412 2SC945
D432
D431
Q413 2SC945
Q408 2SC945
Q409 2SC945
Q411 2SC945
R448 22K
Q422 2SC945
Q421 2SC945
Q423 2SA733
R490 330K
Q424 2SA733
R483 10K
C405 2200μ 16V
C406 2200μ 16V
R412 330K
R414 330K
R415 330K
R417 330K
D406
D405
C410 4700P
D409
D404
D408
D403
IC404 μPD4011C
D429
D430
R474 27K
R475 33K
R446 330K
R444 330K
R451 330K
R449 330K
Q414 2SC945
Q410 2SC945
R454 22K
R480 12K
R481 39K
D427
D428
C427 0.056μ
Q418 2SC945
Q425 2SC945
R488 2K
R489 3.3K
R453 1M
R461 2.2M
R459 22K
R467 1M
R468 5.6K
Q426 2SA733(P)
C407 2200μ 16V
IC407 μA7912
OUT
IN
GND
R431 1M
R429 330K
R433 330K
R460 330K
D423
D422
C428 4.7μ 25V (LN)
D442
D441
D414
D415
D413
R423 330K
R430 330K
R432 1M
R427 330K
C413 4700P
D418
D419
D417
Q428 2SC945
R494 330K
Q403 2SA733
Q402 3.3μ 50V
C404 2200μ 25V
IC406 μA7812
Q430 2SC945
R520 1.8M
Cue
VR403 100K
R404 330K
R405 100K
R406 10K
IC402 μPD4011C
D416
D437
R424 330K
R441 330K
Q406 2SA733
C424 3.3μ 25V (LN)
Q427 2SA733
R513 330K
D443
R521 180K
R502 100K
R471 68K
R403 390K
Q402 2SC945
C403 4700μ 25V
C401 1μ 50V(LN)
C415 3300P
R428 330K
C414 4700P
D420
R496 10K
Q429 2SC945
C426 4.7μ 25V
D435
R498 150K
D436
D438
Stop
VR402 5K
R402 18K
Q401 2SC945
D425
C418 4700P
R437 330K
R442 330K
D439
C409 0.033μ
R410 1M
R409 1M
R501
R503 15K(F)
IC405 μPC4558C
R518 680
D401 RB-151
R401 100K
R456 470K
R457 22K
C420 10μ 16V
R426 330K
R443 330K
R440 330K
D440
R524 2.2M
R470 56K
Play
VR401 5K
R458 330K
Q415 2SC945
Q404 2SC945
R436 22K
IC403 μPD4011C
R462 10K
R522 33K
R465 1K
R463 100K
Q417 2SC945
C425 10P(J)
R408 5.6
D424
R455 10K
R435 12K
R434 33K
D421
C412 0.15μ
D412
R422
Q405 2SA733
C417 1μ 50V
R438 330K
C422 1μ 50V(LN)
D444
Q416 2SC945
R464 6.8K
CN-2
Q420 2SA634
Q419 2SC1096
Q431 2SC1096
Q432 2SA634
C408 330μ 16V
CN-1
R407 10 2W
R439 330K

Fig. 7.7.1 Serial No.: A30206070 –

Note: Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04073B	**Logic P.C.B. Ass'y (U.S.A., Canada & Japan)**
	BA04109B	**Logic P.C.B. Ass'y (Sweden, Swiss, UK, Germany & Australia)** Serial No.: A30206070 –
	0B07841C	Logic P.C.B.
IC401-403	0B06178A	IC µPD4011C
IC404	0B06143A	IC µPD4001C
IC405	0B06124B	IC µPC4558C
IC406	0B06192A	Regulator µA7812PC
IC407	0B06193A	Regulator µA7912PC
Q401, 402 404 408-418 421, 422 425, 428 429, 430	0B01872A	Transistor 2SC945 (20 pcs.)
Q403, 405 406, 407 423, 424 427	0B06013A	Transistor 2SA733 (Q, P)
Q419, 431	0B06020A	Transistor 2SC1096
Q420, 432	0B06012A	Transistor 2SA634
Q426	0B06155A	Transistor 2SA733 (P)
D401	0B06183A	Diode Bridge RB-151
D402-432 434-444	0B06181A	Silicon Diode 1SS53 (42 pcs.)
VR401,402	0B03831A	Semi-fixed Volume 5K
VR403	0B03832A	Semi-fixed Volume 100K
R401, 405 463, 469 472, 502 504, 517	0B01889A	Carbon Resistor 100K ERD-25T J
R402	0B05560A	Carbon Resistor 18K ERD-25T J
R403	0B05676A	Carbon Resistor 390K ERD-25T J
R404 411-418 423-430 433 437-444 446, 449 451, 458 460, 478 479, 482 484, 487 490, 494 506, 508 509, 510 513, 516	0B05627A	Carbon Resistor 330K ERD-25T J
R406, 455 462, 483 496	0B01888A	Carbon Resistor 10K ERD-25T J
R407	0B09179A	Fail Safe Type Resistor 10 SF2B J
R408	0B05940A	Fail Safe Type Resistor 5.6 ERD-14F J
R409, 410 431, 432 453, 467	0B05776A	Carbon Resistor 1M ERD-25T J
R419, 464 497	0B01682A	Carbon Resistor 6.8K ERD-25T J
R420, 421 461, 466 500, 524	0B05671A	Carbon Resistor 2.2M ERD-25T J
R422	0B05698A	Carbon Resistor 1.5K ERD-25T J
R434, 475 522	0B05509A	Carbon Resistor 33K ERD-25T J
R435, 480	0B09263A	Carbon Resistor 12K ERD-25T J
R436, 445 447, 448 450, 452 454, 457 459	0B05615A	Carbon Resistor 22K ERD-25T J
R456	0B01684A	Carbon Resistor 470K ERD-25T J
R465	0B01857A	Carbon Resistor 1K ERD-25T J
R468	0B01887A	Carbon Resistor 5.6K ERD-25T J
R470, 485	0B05508A	Carbon Resistor 56K ERD-25T J
R471	0B05692A	Carbon Resistor 68K ERD-25T J
R473	0B09212A	Fail Safe Type Resistor 2.2 RDF-25S J
R474, 499	0B05743A	Carbon Resistor 27K ERD-25T J
R476, 477	0B01856A	Carbon Resistor 8.2K ERD-25T J
R481, 486 491, 492	0B01854A	Carbon Resistor 39K ERD-25T J
R488	0B09301A	Carbon Resistor 2K ERD-25T J
R489	0B01681A	Carbon Resistor 3.3K ERD-25T J
R493,495 505	0B05625A	Carbon Resistor 220K ERD-25T J
R498	0B05626A	Carbon Resistor 150K ERD-25T J
R501	0B09328A	Metal Film Resistor 9.1K SN15K2E F
R503	0B09340A	Metal Film Resistor 15K SN15K2E F
R507	0B09365A	Metal Film Resistor 4.32K SN15K2E F
R511	0B09367A	Metal Film Resistor 174K SN15K2E F
R514	0B09366A	Metal Film Resistor 287K SN15K2E F
R518	0B05794A	Carbon Resistor 680 ERD-25T J
R520	0B05680A	Carbon Resistor 1.8M ERD-25T J
R521	0B05640A	Carbon Resistor 180K ERD-25T J
R523	0B09049A	Fail Safe Type Resistor 22 RDF-25S J
C401, 422	0B09223A	Electrolytic Capacitor 1µ 50V (LN)
C402	0B01863A	Electrolytic Capacitor 3.3µ 50V
C403	0B09250A	Electrolytic Capacitor 4700µ 25V
C404	0B05654A	Electrolytic Capacitor 2200µ 25V
C405, 406 407	0B01406A	Electrolytic Capacitor 2200µ 16V
C408	0B01502A	Electrolytic Capacitor 330µ 16V
C409	0B05513A	Mylar Capacitor 0.033µ 50V
C410, 411 413, 414 418	0B05556A	Mylar Capacitor 4700P 50V
C412	0B09171A	Mylar Capacitor 0.15µ 50V
C415	0B09166A	Mylar Capacitor 3300P 50V
C416	0B00093A	Mylar Capacitor 0.1µ 50V
C417	0B01405A	Electrolytic Capacitor 1µ 50V
C420	0B01412A	Electrolytic Capacitor 10µ 16V
C421, 427	0B01676A	Mylar Capacitor 0.056µ 50V
C423, 424	0B09147A	Electrolytic Capacitor 3.3µ 25V (LN)
C425	0B09277A	Ceramic Capacitor 10P 50V J
C426	0B01402A	Electrolytic Capacitor 4.7µ 25V
C428	0B09333A	Electrolytic Capacitor 4.7µ 25V (LN)
	0B08579A	15P-S Post (1 pce.)
	0B08184A	3P-S Post (1 pce.)
	0B08568B	Heat Sink A301 (1 pce.)
	0B08603A	Mica for Transistor (2 pcs.)
	0B08604A	Bushing for Transistor (2 pcs.)
	0E00607A	Screw M3x8 Philips Pan Head (2 pcs.)
	0E00507A	Nut Hex. M3 (2 pcs.)
	0E00857A	BT Screw M3x6 Philips Binding Head (2 pcs.)
	0E00037A	Earth Lug B-5 (1 pce.)
	–	Wrapping Pin (33 pcs.)
	–	Jumper Wire (85 pcs.)
*	0B08349A	Fuse Clip (4 pcs.)
*	0B08161U	Fuse 630mAT 250V (2 pcs.)
*	0M04062A	Fuse Label 630mAT (1 pce.)

* included only in Logic P.C.B. Ass'y (BA04109B)

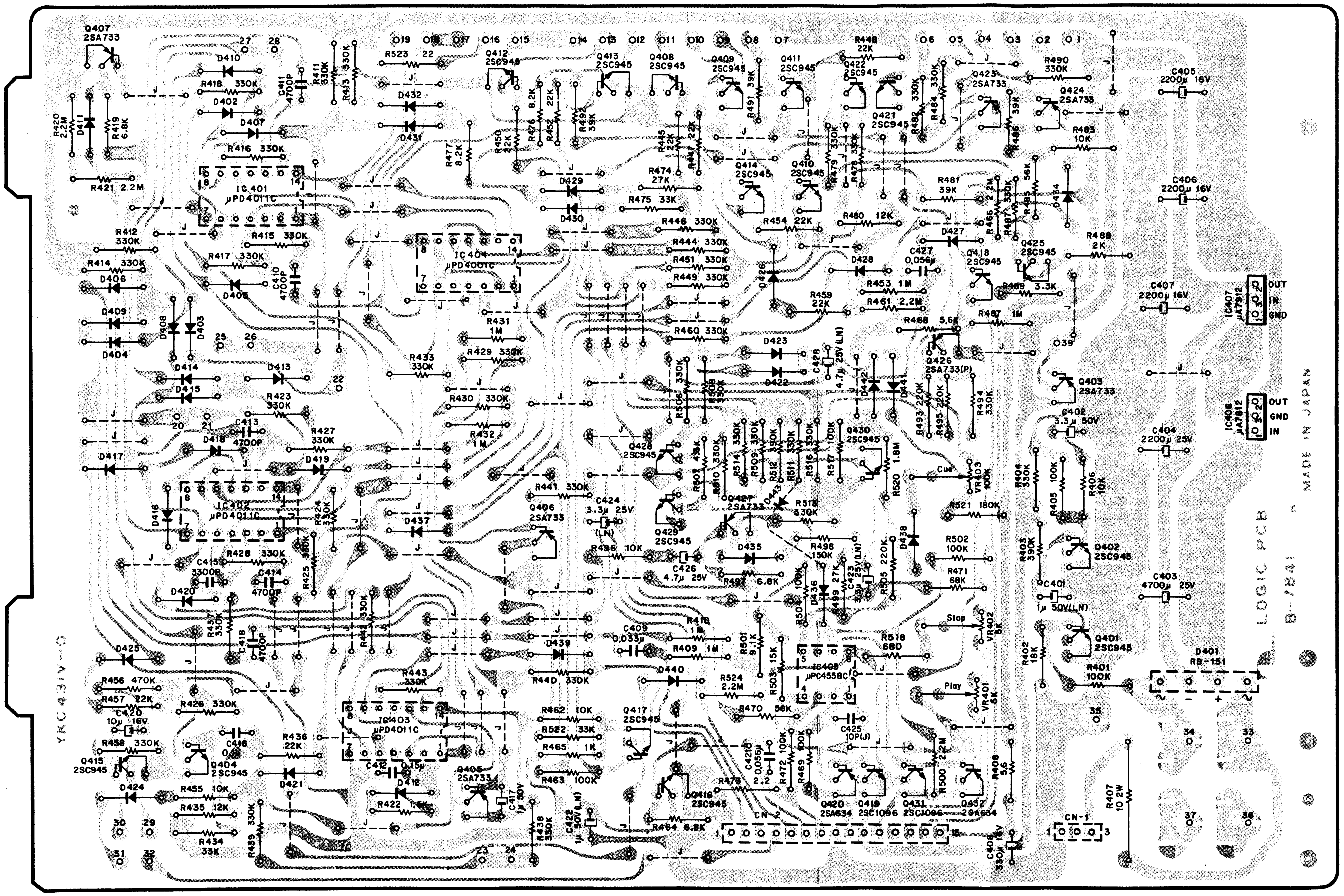

Q407
2SA733
D410
R418 330K
D402
D407
R416 330K
R420 2.2M
D411
R419 6.8K
R421 2.2M
IC401
µPD4011C
C411 4700P
R411 330K
R413 330K
R523 22
Q412 2SC945
D432
D431
R47 8.2K
R450 22K
R476 8.2K
R452 22K
R492 39K
Q413 2SC945
Q408 2SC945
R445 22K
R447 22K
R474 27K
R475 33K
D429
D430
Q409 2SC945
R491 39K
Q411 2SC945
Q414 2SC945
Q410 2SC945
R448 22K
Q422 2SC945
Q421 2SC945
R479 330K
R478 330K
R482 330K
R484 330K
Q423 2SA733
R490 330K
Q424 2SA733
R486 39K
R483 10K
R481 39K
R480 12K
R485 56K
D434
C405 2200µ 16V
C406 2200µ 16V
R412 330K
R414 330K
R415 330K
R417 330K
D406
D405
C410 4700P
D409
D404
D408
D403
IC404
µPD4001C
R446 330K
R444 330K
R451 330K
R449 330K
R454 22K
D426
D427
D428
C427 0.056µ
Q418 2SC945
Q425 2SC945
R488 2K
R453 1M
R461 2.2M
R459 22K
R489 3.3K
R487 1M
R468 5.6K
C407 2200µ 16V
IC407 µA7912
OUT
IN
GND
R431 1M
R429 330K
R433 330K
R460 330K
D423
D422
C428 4.7µ 25V(LN)
D442
D441
Q426 2SA733(P)
R493 220K
R495 220K
R494 330K
Q403 2SA733
D414
D413
D415
R423 330K
R430 330K
R432 1M
C413 4700P
D418
R427 330K
D419
D417
R506 330K
R508 330K
Q428 2SC945
R514 330K
R509 330K
R512 330K
R511 330K
R516 330K
R517 100K
Q430 2SC945
R520 1.8M
Cue
VR403 100K
Q402
C402 3.3µ 50V
C404 2200µ 25V
IC406 µA7812
OUT
GND
IN
MADE IN JAPAN
LOGIC PCB
B-784
D416
IC402
µPD4011C
R424 330K
R441 330K
Q406 2SA733
C424 3.3µ 25V (LN)
D437
Q427 2SA733
D443
R513 330K
R521 180K
R404 330K
R405 100K
R406 10K
Q429 2SC945
R496 10K
C426 4.7µ 25V
D435
R498 150K
D438
R502 100K
R403 390K
Q402 2SC945
R428 330K
C415 3300P
C414 4700P
R425 330K
D420
R497 6.8K
R504 100K
R499 27K
C423 33µ 25V(LN)
R505 220K
R471 68K
C403 4700µ 25V
C401 1µ 50V(LN)
R437 330K
C418 4700P
R442 330K
D439
C409 0.033µ
R410 1M
R409 1M
R501 9.1K
Stop
VR402 5K
R518 680
Q401 2SC945
R402 15K
D401 RB-151
R401 100K
D425
R456 470K
R457 22K
C420 10µ 16V
R426 330K
R443 330K
R440 330K
D440
R524 2.2M
R503 15K
IC405 µPC4558C
Play
VR401 5K
R458 330K
Q415 2SC945
C416
Q404 2SC945
R436 22K
IC403 µPD4011C
R462 10K
R522 33K
R465 1K
R463 100K
Q417 2SC945
R470 56K
C425 10P(J)
C412 0.15µ
D421
D424
R455 10K
R435 12K
R434 33K
R439 330K
R422 1.5K
D412
Q405 2SA733
C417 1µ 50V
R438 330K
C422 1µ 50V(LN)
R464 6.8K
Q416 2SC945
R473 2.2
C429 0.056µ
R472 100K
R469 100K
Q420 2SA634
Q419 2SC1096
Q431 2SC1096
Q432 2SA634
R500 2.2M
R408 5.6
C408 330µ 16V
R407 10 2W
CN-2
CN-1
YKC431V-G

Fig. 7.7.2 Serial Nos.: A30205002 – A30206069

Note: Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04073A	**Logic P.C.B. Ass'y (U.S.A., Canada & Japan)**
	BA04109A	**Logic P.C.B. Ass'y (Sweden, Swiss, UK, Germany & Australia)** Serial Nos.: A30205002 – A30206069
	0B07841B	Logic P.C.B.
IC401-403	0B06178A	IC μPD4011C
IC404	0B06143A	IC μPD4001C
IC405	0B06124B	IC μPC4558C
IC406	0B06192A	Regulator μA7812PC
IC407	0B06193A	Regulator μA7912PC
Q401, 402 404 408-418 421, 422 425, 428 429, 430	0B01872A	Transistor 2SC945 (20 pcs.)
Q403, 405 406, 407 423, 424 427	0B06013A	Transistor 2SA733 (Q, P)
Q419, 431	0B06020A	Transistor 2SC1096
Q420, 432	0B06012A	Transistor 2SA634
Q426	0B06155A	Transistor 2SA733 (P)
D401	0B06183A	Diode Bridge RB-151
D402-432 434-443	0B06181A	Silicon Diode 1SS53 (41 pcs.)
VR401,402	0B03831A	Semi-fixed Volume 5K
VR403	0B03832A	Semi-fixed Volume 100K
R401, 405 463, 469 472, 502 504, 517	0B01889A	Carbon Resistor 100K ERD-25T J
R402	0B05560A	Carbon Resistor 18K ERD-25T J
R403, 512	0B05676A	Carbon Resistor 390K ERD-25T J
R404 411-418 423-430 433 437-444 446, 449 451, 458 460, 478 479, 482 484, 487 490, 494 506, 508 509, 510 511, 513 514, 516	0B05627A	Carbon Resistor 330K ERD-25T J
R406, 455 462, 483 496	0B01888A	Carbon Resistor 10K ERD-25T J
R407	0B09179A	Fail Safe Type Resistor 10 SF2B J
R408	0B05940A	Fail Safe Type Resistor 5.6 ERD-14F J
R409, 410 431, 432 453, 467	0B05776A	Carbon Resistor 1M ERD-25T J
R419, 464 497	0B01682A	Carbon Resistor 6.8K ERD-25T J
R420, 421 461, 466 500, 524	0B05671A	Carbon Resistor 2.2M ERD-25T J
R422	0B05698A	Carbon Resistor 1.5K ERD-25T J
R434, 475 522	0B05509A	Carbon Resistor 33K ERD-25T J
R435, 480	0B09263A	Carbon Resistor 12K ERD-25T J
R436, 445 447, 448 450, 452 454, 457 459	0B05615A	Carbon Resistor 22K ERD-25T J
R456	0B01684A	Carbon Resistor 470K ERD-25T J
R465	0B01857A	Carbon Resistor 1K ERD-25T J
R468	0B01887A	Carbon Resistor 5.6K ERD-25T J
R470, 485	0B05508A	Carbon Resistor 56K ERD-25T J
R471	0B05692A	Carbon Resistor 68K ERD-25T J
R473	0B09212A	Fail Safe Type Resistor 2.2 RDF-25S J
R474, 499	0B05743A	Carbon Resistor 27K ERD-25T J
R476, 477	0B01856A	Carbon Resistor 8.2K ERD-25T J
R481, 486 491, 492	0B01854A	Carbon Resistor 39K ERD-25T J
R488	0B09301A	Carbon Resistor 2K ERD-25T J
R489	0B01681A	Carbon Resistor 3.3K ERD-25T J
R493,495 505	0B05625A	Carbon Resistor 220K ERD-25T J
R498	0B05626A	Carbon Resistor 150K ERD-25T J
R501	0B09226A	Carbon Resistor 9.1K ERD-25T J
R503	0B01683A	Carbon Resistor 15K ERD-25T J
R507	0B09307A	Carbon Resistor 4.3K ERD-25T J
R518	0B05794A	Carbon Resistor 680 ERD-25T J
R520	0B05680A	Carbon Resistor 1.8M ERD-25T J
R521	0B05640A	Carbon Resistor 180K ERD-25T J
R523	0B09049A	Fail Safe Type Resistor 22 RDF-25S J
C401, 422	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C402	0B01863A	Electrolytic Capacitor 3.3μ 50V
C403	0B09250A	Electrolytic Capacitor 4700μ 25V
C404	0B05654A	Electrolytic Capacitor 2200μ 25V
C405, 406 407	0B01406A	Electrolytic Capacitor 2200μ 16V
C408	0B01502A	Electrolytic Capacitor 330μ 16V
C409	0B05513A	Mylar Capacitor 0.033μ 50V
C410, 411 413, 414 418	0B05556A	Mylar Capacitor 4700P 50V
C412	0B09171A	Mylar Capacitor 0.15μ 50V
C415	0B09166A	Mylar Capacitor 3300P 50V
C416	0B00093A	Mylar Capacitor 0.1μ 50V
C417	0B01405A	Electrolytic Capacitor 1μ 50V
C420	0B01412A	Electrolytic Capacitor 10μ 16V
C421, 427	0B01676A	Mylar Capacitor 0.056μ 50V
C423, 424	0B09147A	Electrolytic Capacitor 3.3μ 25V (LN)
C425	0B09277A	Ceramic Capacitor 10P 50V J
C426	0B01402A	Electrolytic Capacitor 4.7μ 25V
C428	0B09333A	Electrolytic Capacitor 4.7μ 25V (LN)
	0B08579A	15P-S Post (1 pce.)
	0B08184A	3P-S Post (1 pce.)
	0B08568B	Heat Sink A301 (1 pce.)
	0B08603A	Mica for Transistor (2 pcs.)
	0B08604A	Bushing for Transistor (2 pcs.)
	0E00607A	Screw M3x8 Philips Pan Head (2 pcs.)
	0E00507A	Nut Hex. M3 (2 pcs.)
	0E00857A	BT Screw M3x6 Philips Binding Head (2 pcs.)
	0E00037A	Earth Lug B-5 (1 pce.)
	–	Wrapping Pin (33 pcs.)
	–	Jumper Wire (85 pcs.)
*	0B08349A	Fuse Clip (4 pcs.)
*	0B08161U	Fuse 630mAT 250V (2 pcs.)
*	0M04062A	Fuse Label 630mAT (1 pce.)
		* included only in Logic P.C.B. Ass'y (BA04109A)

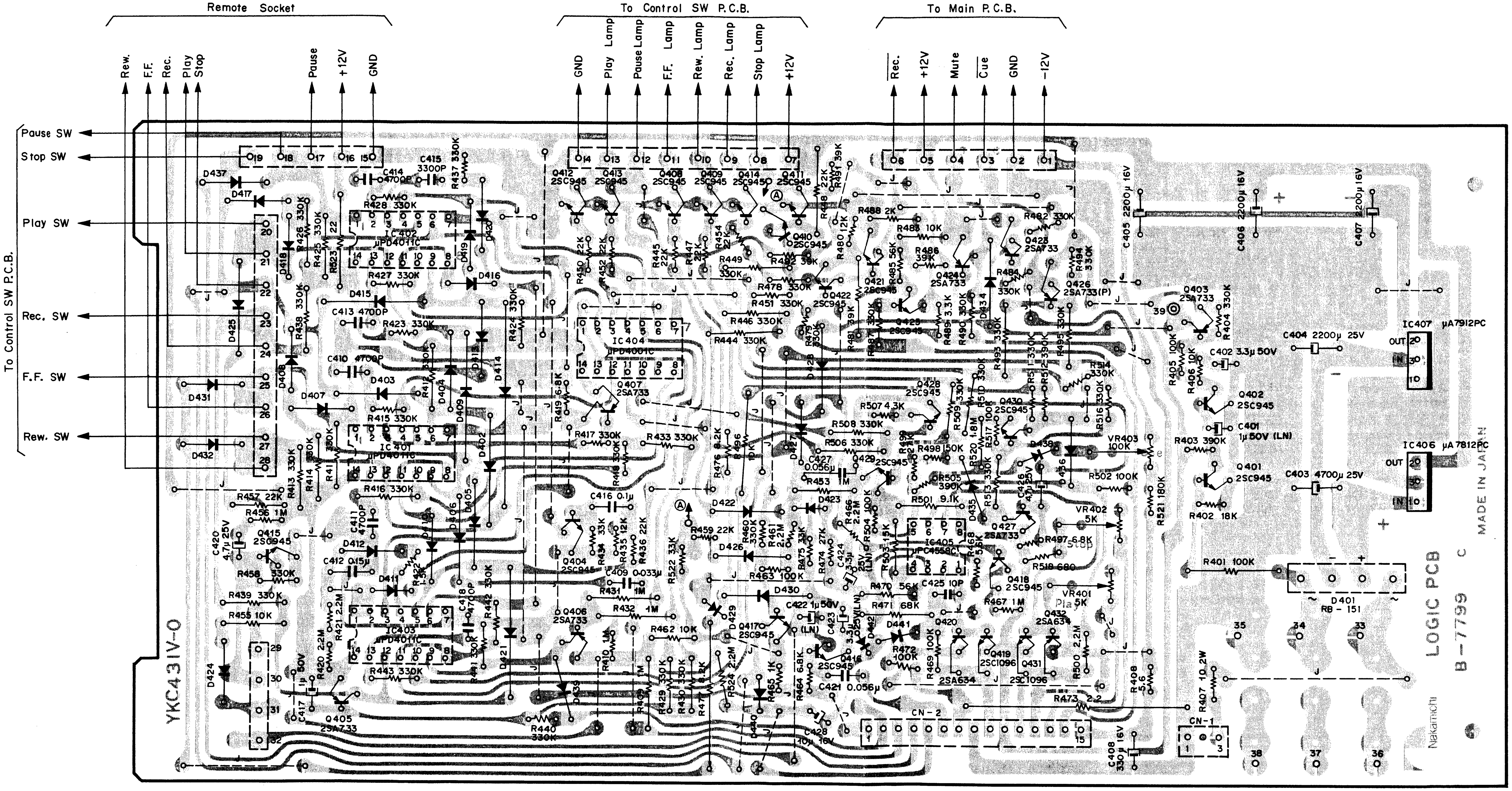

Remote Socket
Rew.
F.F.
Rec.
Play
Stop
Pause
+12V
GND
To Control SW P.C.B.
GND
Play Lamp
Pause Lamp
F.F. Lamp
Rew. Lamp
Rec. Lamp
Stop Lamp
+12V
To Main P.C.B.
Rec.
+12V
Mute
Cue
GND
-12V
Pause SW
Stop SW
Play SW
Rec. SW
F.F. SW
Rew. SW
To Control SW P.C.B.
IC401 μPD4011C
IC402 μPD4011C
IC403 μPD4011C
IC404 μPD4001C
IC405 μPC4558C
IC406 μA7812PC
IC407 μA7912PC
D401 RB-151
CN-1
CN-2
VR401 5K
VR402 5K
VR403 100K
C404 2200μ 25V
C403 4700μ 25V
C405 2200μ 16V
C406 2200μ 16V
C407 2200μ 16V
C408 330μ 16V
R407 10 2W
LOGIC PCB
B-7799 C
MADE IN JAPAN
YKC431V-0
Nakamichi

Fig. 7.7.3 Serial Nos.: A30201001 – A30205001

7.8. Lamp P.C.B. Ass'y

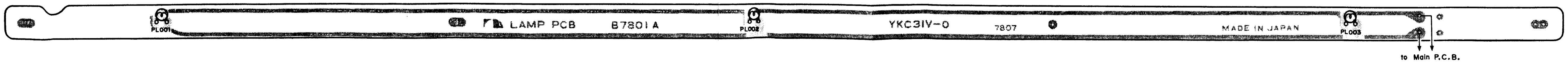

PL001
LAMP PCB
B7801A
PL002
YKC31V-0
7807
MADE IN JAPAN
PL003
to Main P.C.B.

Fig. 7.8

Schematic Ref. No.	Part No.	Description
	BA04036B	**Logic P.C.B. Ass'y (U.S.A., Canada & Japan)**
	BA04040A	**Logic P.C.B. Ass'y (Sweden, Swiss, UK, Germany & Australia)**
		Serial Nos.: A30201001 – A30205001
	0B07799C	Logic P.C.B.
IC401-403	0B06178A	IC μPD4011C (3 pcs.)
IC404	0B06143A	IC μPD4001C
IC405	0B06124B	IC μPC4558C
IC406	0B06192A	Regulator μA7812PC
IC407	0B06193A	Regulator μA7912PC
Q401, 402 404 408-418 421, 422 425, 428 429, 430	0B01872A	Transistor 2SC945 (20 pcs.)
Q403, 405 406, 407 423, 424 427	0B06013A	Transistor 2SA733 (Q, P)
Q419, 431	0B06020A	Transistor 2SC1096
Q420, 432	0B06012A	Transistor 2SA634
Q426	0B06155A	Transistor 2SA733 (P)
D401	0B06183A	Diode Bridge RB-151
D402-432 434-442	0B06181A	Silicon Diode 1SS53 (40 pcs.)
VR401,402	0B03831A	Semi-fixed Volume 5K
VR403	0B03832A	Semi-fixed Volume 100K
R401	0B01889A	Carbon Resistor 100K ERD-25T J
R402	0B05561A	Carbon Resistor 18K ERD-25V J
R403, 505 512	0B05595A	Carbon Resistor 390K ERD-25V J
R404, 415 417, 418 423, 424 427, 428 429, 430 433, 437 440, 441 442, 443 451, 458 460, 478 479, 482 484, 487 490, 494 511, 513 514, 516	0B01921A	Carbon Resistor 330K ERD-25V J
R405, 463 469, 472 502, 504 517	0B01920A	Carbon Resistor 100K ERD-25V J
R406, 462 483	0B01833A	Carbon Resistor 10K ERD-25V J
R407	0B09160A	Fail Safe Type Resistor 10 RSF2B J
R408	0B05940A	Fail Safe Type Resistor 5.6 ERD-14F J
R409, 431 432, 453	0B05776A	Carbon Resistor 1M ERD-25T J
R410, 456 467	0B05564A	Carbon Resistor 1M ERD-25V J

Schematic Ref. No.	Part No.	Description
R411, 412 413, 414 416, 425 426, 438 439, 444 446, 449 493, 495 506, 508 509, 510	0B05627A	Carbon Resistor 330K ERD-25T J
R419, 464 497	0B01877A	Carbon Resistor 6.8K ERD-25V J
R420, 421 461, 466 500, 524	0B05672A	Carbon Resistor 2.2M ERD-25V J
R422	0B05505A	Carbon Resistor 1.5K ERD-25V J
R434, 475 522	0B01879A	Carbon Resistor 33K ERD-25V J
R435, 480	0B05650A	Carbon Resistor 12K ERD-25V J
R436, 445 447, 450 452, 454 457, 459	0B05661A	Carbon Resistor 22K ERD-25V J
R448	0B05615A	Carbon Resistor 22K ERD-25T J
R455, 496	0B01888A	Carbon Resistor 10K ERD-25T J
R465	0B01781A	Carbon Resistor 1K ERD-25V J
R468	0B05673A	Carbon Resistor 5.6K ERD-25V J
R470, 485	0B05563A	Carbon Resistor 56K ERD-25V J
R471	0B05692A	Carbon Resistor 68K ERD-25T J
R473	0B09212A	Fail Safe Type Resistor 2.2 RDF25S J
R474, 499	0B05538A	Carbon Resistor 27K ERD-25V J
R476	0B01878A	Carbon Resistor 8.2K ERD-25V J
R477	0B01856A	Carbon Resistor 8.2K ERD-25T J
R481	0B01854A	Carbon Resistor 39K ERD-25T J
R486, 491 492	0B01885A	Carbon Resistor 39K ERD-25V J
R488	0B09168A	Carbon Resistor 2K ERD-25V J
R489	0B01793A	Carbon Resistor 3.3K ERD-25V J
R498	0B05593A	Carbon Resistor 150K ERD-25V J
R501	0B09226A	Carbon Resistor 9.1K ERD-25T J
R503	0B05591A	Carbon Resistor 15K ERD-25V J
R507	0B09225A	Carbon Resistor 4.3K ERD-25V J
R518	0B05559A	Carbon Resistor 680 ERD-25V J
R520	0B05670A	Carbon Resistor 1.8M ERD-25V J
R521	0B05669A	Carbon Resistor 180K ERD-25V J
R523	0B09049A	Fail Safe Type Resistor 22 RDF25S J
C401, 422	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C402	0B01863A	Electrolytic Capacitor 3.3μ 50V
C403	0B09250A	Electrolytic Capacitor 4700μ 25V
C404	0B05654A	Electrolytic Capacitor 2200μ 25V
C405, 406 407	0B01406A	Electrolytic Capacitor 2200μ 16V
C408	0B01502A	Electrolytic Capacitor 330μ 16V
C409	0B05513A	Mylar Capacitor 0.033μ 50V
C410, 411 413, 414 418	0B05556A	Mylar Capacitor 4700P 50V
C412	0B09171A	Mylar Capacitor 0.15μ 50V
C415	0B09166A	Mylar Capacitor 3300P 50V
C416	0B00093A	Mylar Capacitor 0.1μ 50V
C417	0B01405A	Electrolytic Capacitor 1μ 50V
C420, 426	0B01402A	Electrolytic Capacitor 4.7μ 25V
C421, 427	0B01676A	Mylar Capacitor 0.056μ 50V

Schematic Ref. No.	Part No.	Description
C423, 424	0B09147A	Electrolytic Capacitor 3.3μ 25V (LN)
C425	0B09277A	Ceramic Capacitor 10P 50V J
C428	0B01412A	Electrolytic Capacitor 10μ 16V
	0B08542A	Wrapping Pin 1P (1 pce.)
	0B08545A	Wrapping Pin 4P (1 pce.)
	0B08546A	Wrapping Pin 5P (1 pce.)
	0B08547A	Wrapping Pin 6P (1 pce.)
	0B08549A	Wrapping Pin 8P (1 pce.)
	0B08550A	Wrapping Pin 9P (1 pce.)
	0B08184A	3P-S Post (1 pce.)
	0B08579A	15P-S Post (1 pce.)
	0B08568B	Heat Sink A301 (1 pce.)
	0E00607A	Screw M3x8 Philips Pan Head (3A) (2 pcs.)
	0E00507A	Nut Hex. M3 (2 pcs.)
	0E00857A	BT Screw M3x6 Philips Binding Head (2 pcs.)
	0E00037A	Earth Lug B-5 (1 pce.)
	0B08603A	Mica for Transistor (2 pcs.)
	0B08604A	Bushing for Transistor (2 pcs.)
*	0B08349A	Fuse Clip (4 pcs.)
*	0B08161U	Fuse 630mAT 250V (2 pcs.)
*	0M04062A	Fuse Label 630mAT (1 pce.)
		* included only in Logic P.C.B. Ass'y (BA04040A)
	BA03974A	**Lamp P.C.B. Ass'y**
	0B07801A	Lamp P.C.B.
PL001,002 003	0B08553A	Lamp 14V 80mA
CN1	0B08575A	3P-H Connector A301

8. MECHANISM ASS'Y AND PARTS LIST

8.1. Synthesis

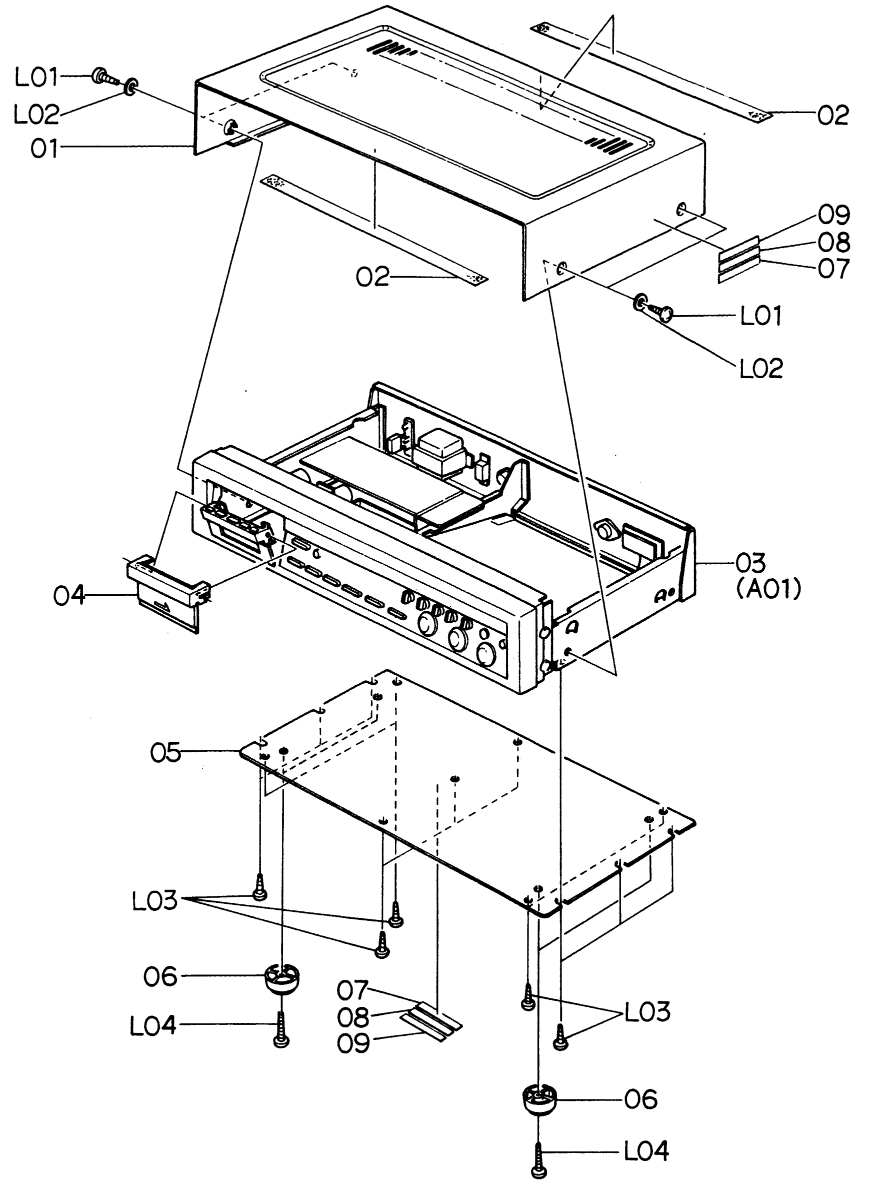


Fig. 8.1

Schematic Ref. No.	Part No.	Description	Q'ty
	Synthesis		
01	0H03681C	Top Coper	1
02	0H03580B	Top Cover Himelon	2
03	JA03450A	Synthesis Mechanism 581 (U.S.A. & Canada)	1
	JA03451A	Synthesis Mechanism 581 (Japan)	1
	JA03453A	Synthesis Mechanism 581 (Others)	1
	JA03455A	Synthesis Mechanism 581 (UK)	1
	JA03621A	Synthesis Mechanism 581 (Australia)	1
	JA03513A	Synthesis Mechanism 581 (220V Class 2)	1
04	0H03689B	Acrylic Cassette Compartment Cover	1
05	0J03972B	Bottom Cover	1
06	0J03825A	Leg S	4
07	0M03799A	Caution Label G	2
08	0M03800A	Caution Label H	2
09	0M03883A	Lamp Caution Label	2
L01	0E00858A	BT Screw M4x6 Philips Binding Head (Black)	4
L02	0E00736A	Washer 4mm (Black)	4
L03	0E00857A	BT Screw M3x6 Philips Binding Head	13
L04	0E00852A	BT Screw M4x12 Philips Binding Head	4

Schematic Ref. No.	Part No.	Description	Q'ty
A01	**JA03450A**	**Synthesis Mechanism 581 (U.S.A. & Canada)**	**1**
	JA03451A	**Synthesis Mechanism 581 (Japan)**	**1**
	JA03453A	**Synthesis Mechanism 581 (Others)**	**1**
	JA03455A	**Synthesis Mechanism 581 (UK)**	**1**
	JA03513A	**Synthesis Mechanism 581 (220V Class 2)**	**1**
	JA03621A	**Synthesis Mechanism 581 (Australia)**	**1**
		Serial No.: A30205002 –	
01	0H03706A	Volume Knob	3
02	0H03712C	Switch Knob	5
03	HA03812A	Front Panel Ass'y 581	1
04	JA03390A	Headphone Jack Ass'y	1
05	CA08049B	Mechanism Ass'y 581	1
06	JA03468B	Chassis Ass'y 581 (U.S.A. & Canada)	1
	JA03469B	Chassis Ass'y 581 (Japan)	1
	JA03471B	Chassis Ass'y 581 (Others)	1
	JA03473B	Chassis Ass'y 581 (UK)	1
	JA03515B	Chassis Ass'y 581 (220V Class 2)	1
	JA03622B	Chassis Ass'y 581 (Australia)	1
L01	0E00877A	ST Screw M3x5 Philips Binding Head	6
L02	0E00857A	BT Screw M3x6 Philips Binding Head	1
L03	0E00867A	BT Screw M4x15 Philips Binding Head	3
L04	0E00878A	BT Screw M4x20 Philips Binding Head	1
A01	**JA03450A**	**Synthesis Mechanism 581 (U.S.A. & Canada)**	**1**
	JA03451A	**Synthesis Mechanism 581 (Japan)**	**1**
	JA03453A	**Synthesis Mechanism 581 (Others)**	**1**
	JA03455A	**Synthesis Mechanism 581 (UK)**	**1**
	JA03513A	**Synthesis Mechanism 581 (220V Class 2)**	**1**
	JA03621A	**Synthesis Mechanism 581 (Australia)**	**1**
		Serial Nos.: A30201001 – A30205001	
01	0H03706A	Volume Knob	3
02	0H03712C	Switch Knob	5
03	HA03812A	Front Panel Ass'y 581	1
04	JA03390A	Headphone Jack Ass'y	1
05	CA08049B	Mechanism Ass'y 581	1
06	JA03468A	Chassis Ass'y 581 (U.S.A. & Canada)	1
	JA03469A	Chassis Ass'y 581 (Japan)	1
	JA03471A	Chassis Ass'y 581 (Others)	1
	JA03473A	Chassis Ass'y 581 (UK)	1
	JA03515A	Chassis Ass'y 581 (220V Class 2)	1
	JA03622A	Chassis Ass'y 581 (Australia)	1
L01	0E00877A	ST Screw M3x5 Philips Binding Head	6
L02	0E00857A	BT Screw M3x6 Philips Binding Head	1
L03	0E00867A	BT Screw M4x15 Philips Binding Head	3
L04	0E00878A	BT Screw M4x20 Philips Binding Head	1
B01	**HA03812A**	**Front Panel Ass'y 581**	**1**
		Serial No.: A30205253 –	
01	HA03776A	Meter Ass'y	1
02	HA03777A	Lamp House Cover Ass'y	1
03	0H03697A	Aluminum Mirror	1
04	0J03979B	Flange Holder	1
05	HA03803A	Push Button Ass'y A	1
06	HA03805A	Push Button Ass'y C	1
07	HA03806A	Counter Reset Button Ass'y	1
08	0J03965C	Control Button Shaft Holder	1
09	0J03986B	Control Button Spring	1
10	0J03966A	Control Button Shaft	1
11	HA03810A	Control Button A Ass'y	1
12	HA03811A	Control Button B Ass'y	5
13	0H03714B	Hole Plug	1
14	HA03795D	Front Panel Sub Ass'y	1
L01	0E00793A	BT Screw M2x6 Philips Pan Head	5
L02	0E00840A	BT Screw M2x8 Philips Pan Head	1
L03	0E00100A	Washer 2mm	1
L04	0E00873A	BT Screw M2.6x5 Philips Binding Head	3
L05	0E00841A	BT Screw M2x4 Philips Pan Head	4
L06	0E00794A	BT Screw M2x5 Philips Pan Head	3
B01	**HA03793A**	**Front Panel Ass'y 581**	**1**
		Serial Nos.: A30201001 – A30205252	
01	HA03776A	Meter Ass'y	1
02	HA03777A	Lamp House Cover Ass'y	1
03	0H03697A	Aluminum Mirror	1
04	0J03979B	Flange Holder	1
05	HA03803A	Push Button Ass'y A	1
06	HA03805A	Push Button Ass'y C	1
07	HA03806A	Counter Reset Button Ass'y	1
08	0J03965C	Control Button Shaft Holder	1
09	0J03986B	Control Button Spring	1
10	0J03966A	Control Button Shaft	1
11	HA03797A	Control Button A Ass'y	1
12	HA03798A	Control Button B Ass'y	5
13	0H03714B	Hole Plug	1
14	HA03795D	Front Panel Sub Ass'y	1
L01	0E00793A	BT Screw M2x6 Philips Pan Head	5
L02	0E00840A	BT Screw M2x8 Philips Pan Head	1
L03	0E00100A	Washer 2mm	1
L04	0E00873A	BT Screw M2.6x5 Philips Binding Head	3
L05	0E00841A	BT Screw M2x4 Philips Pan Head	4
L06	0E00794A	BT Screw M2x5 Philips Pan Head	3

8.2. Synthesis Mechanism 581 (A01)

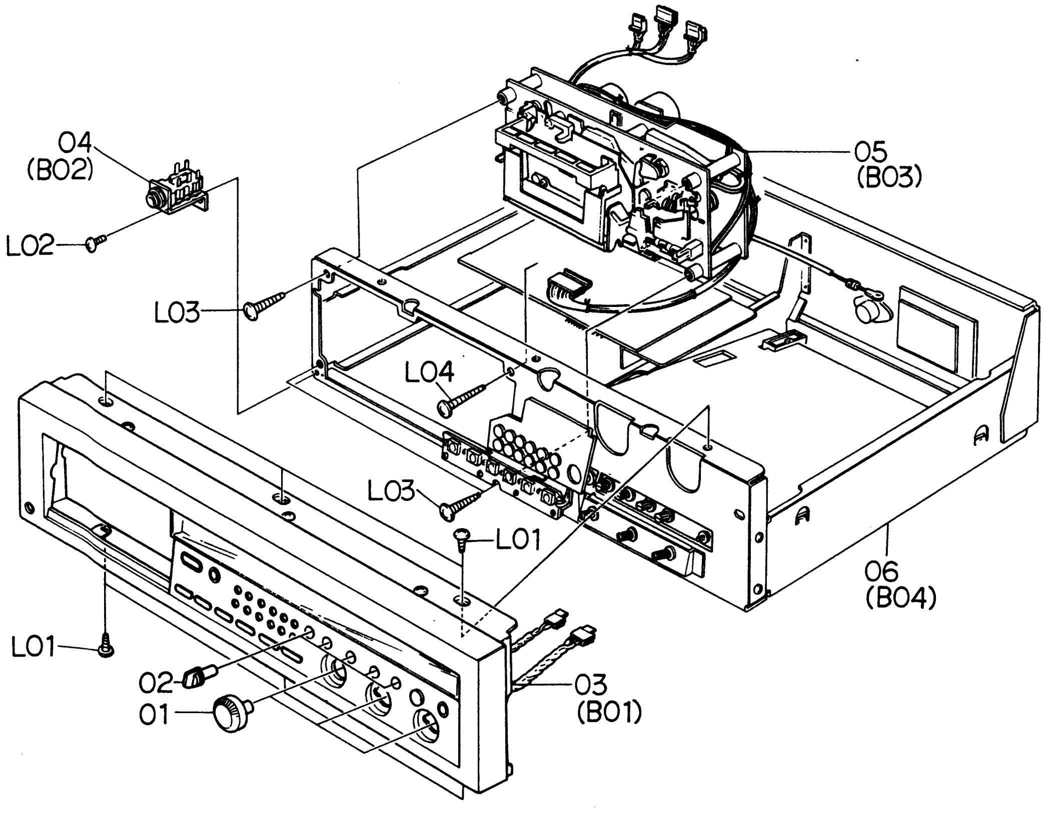

04
(B02)
L02
L03
L04
L03
L01
L01
02
01
05
(B03)
06
(B04)
03
(B01)

Fig. 8.2

8.3. Front Panel Ass'y 581 (B01)

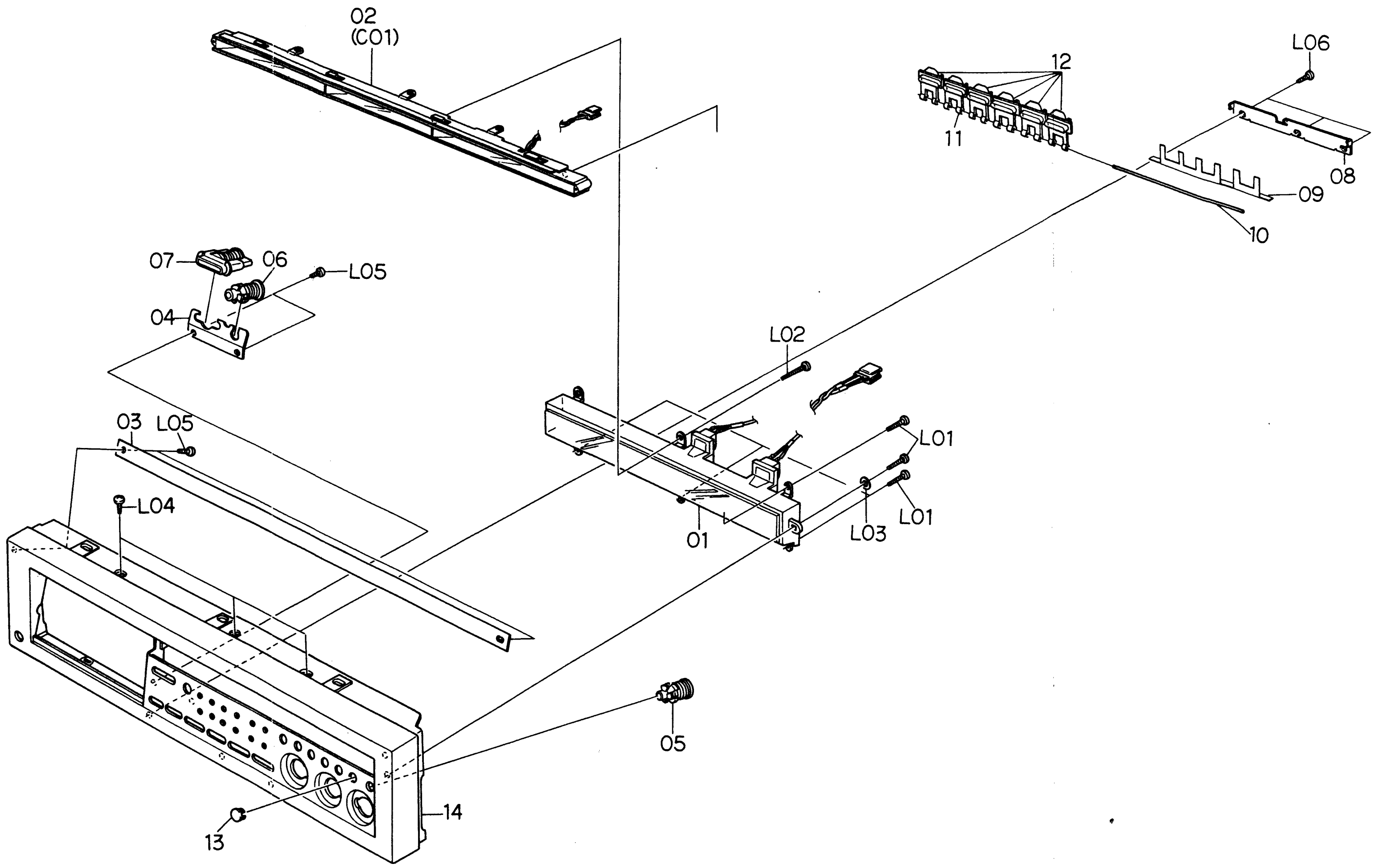

02
(C01)
12
L06
11
08
09
10
07
06
L05
04
L02
L01
03
L05
L04
01
L03
L01
05
14
13

Fig. 8.3

8.4. Headphone Jack Ass'y (B02)

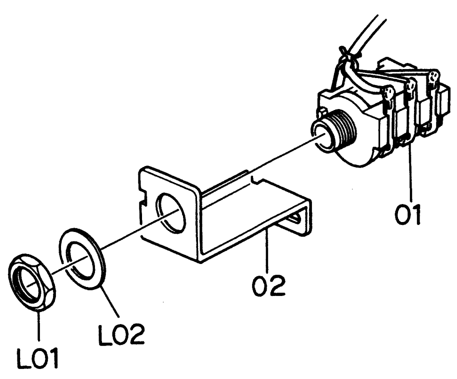

01
02
L01
L02

Fig. 8.4

Schematic Ref. No.	Part No.	Description	Q'ty
B02	JA03390A	Headphone Jack Ass'y	1
01	0B08511A	Headphone Jack	1
02	0J03975A	Jack Holder	1
L01	–	Jack Nut	(1)
L02	–	Jack Washer	(1)

8.5. Mechanism Ass'y 581 (B03)

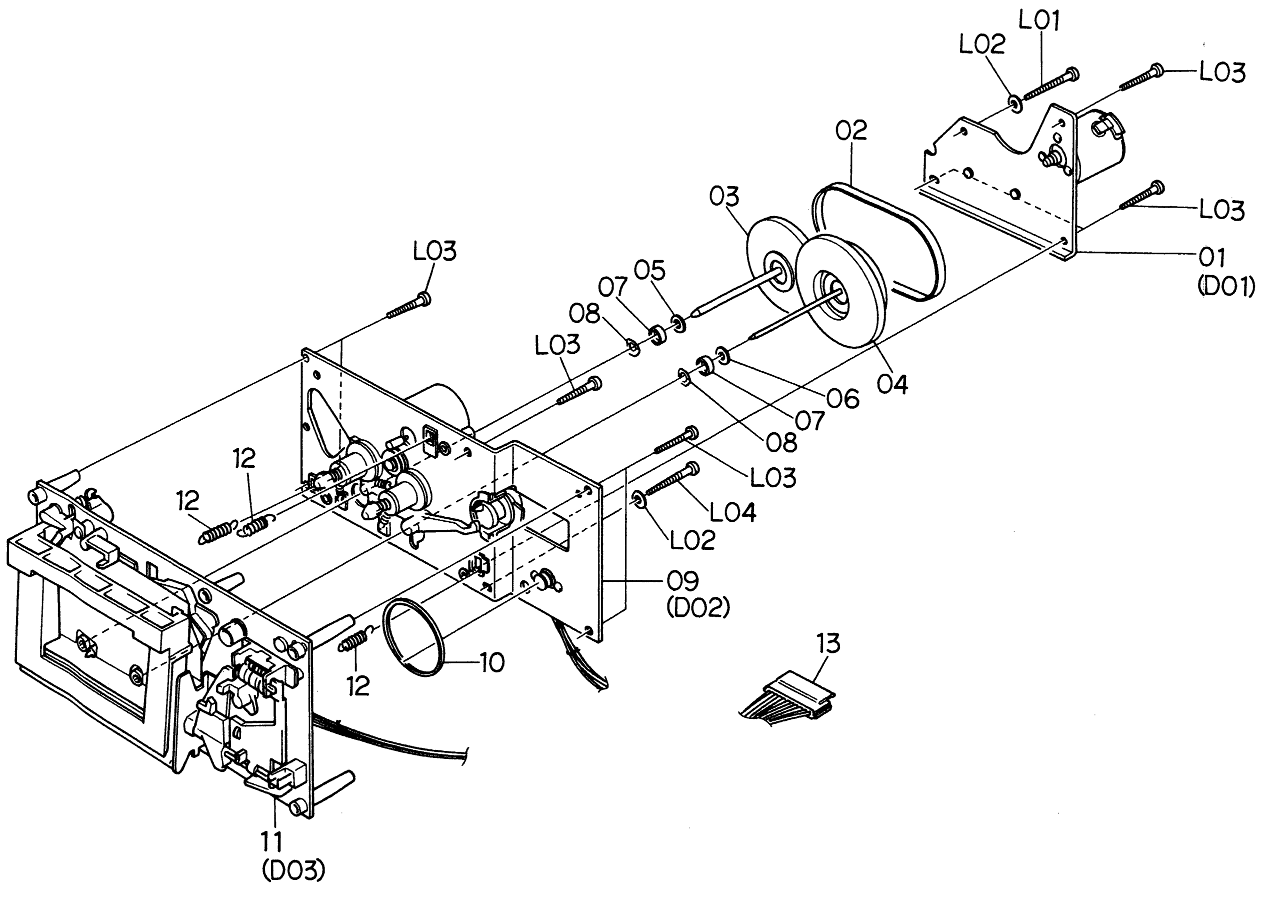


Fig. 8.5

8.6. Chassis Ass'y 581 (B04)

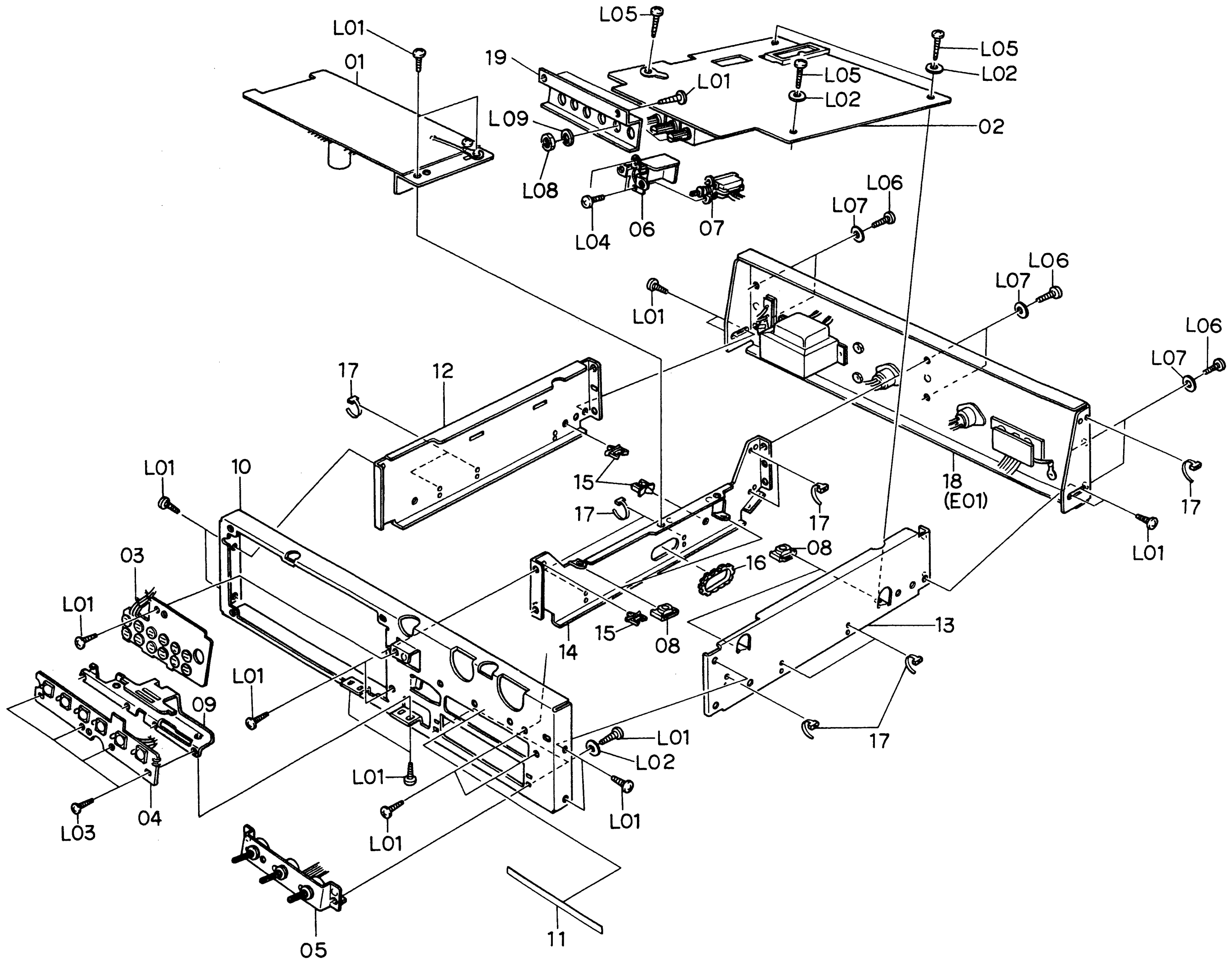


Fig. 8.6

Schematic Ref. No.	Part No.	Description	Q'ty
B03	CA08049B	**Mechanism Ass'y 581**	1
01	CA08017B	Flywheel Holder Ass'y	1
02	0C08096C	Capstan Belt	1
03	CA08014A	Supply Flywheel Ass'y	1
04	CA08015A	Take-up Flywheel Ass'y	1
05	0C08021B	Thrust Washer 3.1mm	1
06	0C08020B	Thrust Washer 2.6mm	1
07	0C08069C	Flange Thrust Cap	2
08	0C08022B	Flange Thrust Spring	2
09	CA08065A	Sub Mechanism Chassis Ass'y	1
10	0C08099B	Control Motor Belt	1
11	CA08077B	Main Mechanism Chassis Ass'y	1
12	0C08175A	Head Base L Spring	3
13	0B08578D	15P-H Connector	1
L01	0E00834A	BT Screw M3x30 Philips Pan Head	1
L02	0E00178A	Washer 3mm	2
L03	0E00833A	BT Screw M3x20 Philips Pan Head	8
L04	0E00835A	BT Screw M3x25 Philips Pan Head	1

Schematic Ref. No.	Part No.	Description	Q'ty
B04	JA03468B	**Chassis Ass'y 581 (U.S.A. & Canada)**	1
	JA03469B	**Chassis Ass'y 581 (Japan)**	1
	JA03471B	**Chassis Ass'y 581 (Others)**	1
	JA03473B	**Chassis Ass'y 581 (UK)**	1
	JA03515B	**Chassis Ass'y 581 (220V Class 2)**	1
	JA03622B	**Chassis Ass'y 581 (Australia)**	1
		Serial No.: A30206070 –	
01	BA04073B	Logic P.C.B. Ass'y (U.S.A., Japan, Canada & Others)	1
	BA04109B	Logic P.C.B. Ass'y (UK, Australia & 220V Class 2)	1
02	BA04015C	Main P.C.B. Ass'y	1
03	BA04014A	Record Cal. P.C.B. Ass'y	1
04	BA03976A	Control Switch P.C.B. Ass'y	1
05	BA04013A	Volume P.C.B. Ass'y	1
06	0J04014A	Power Switch Holder	1
07	0B07253A	Power Switch (U.S.A., Canada & Others)	1
	0B07252A	Power Switch (UK & Australia)	1
	0B07271A	Power Switch (Japan)	1
08	0J04013C	P.C.B. Spacer	4
09	0J03976B	Control Switch Holder	1
10	0J04012B	Front Chassis	1
11	0M04051B	Switch Label	1
12	0J03969C	Side Chassis L	1
13	0J03968D	Side Chassis R	1
14	0J03970D	Center Chassis	1
15	0B08580A	Wire Holder 161	3
16	0B08590A	Free Bushing 80mm	1
17	0B08515A	Insu-Lock	15
18	JA03487A	Rear Panel Ass'y (U.S.A. & Canada)	1
	JA03488A	Rear Panel Ass'y (Japan)	1
	JA03490A	Rear Panel Ass'y (Others)	1
	JA03492A	Rear Panel Ass'y (UK)	1
	JA03517A	Rear Panel Ass'y (220V Class 2)	1
	JA03623A	Rear Panel Ass'y (Australia)	1
19	0J04009C	Switch Holder	1
L01	0E00857A	BT Screw M3x6 Philips Binding Head	22
L02	0E00637A	Washer 3.3mm	5
L03	0E00859A	BT Screw M2.6x6 Philips Binding Head	4
L04	0E00502A	Screw M3x5 Philips Pan Head	2
L05	0E00865A	BT Screw M3x10 Philips Binding Head	4
L06	0E00860A	BT Screw M3x6 Philips Binding Head (Black)	6
L07	0E00157A	Washer 3mm (Black Plastics)	6

Schematic Ref. No.	Part No.	Description	Q'ty
B04	**JA03468B**	**Chassis Ass'y 581 (U.S.A. & Canada)**	**1**
	JA03469B	**Chassis Ass'y 581 (Japan)**	**1**
	JA03471B	**Chassis Ass'y 581 (Others)**	**1**
	JA03473B	**Chassis Ass'y 581 (UK)**	**1**
	JA03515B	**Chassis Ass'y 581 (220V Class 2)**	**1**
	JA03622B	**Chassis Ass'y 581 (Australia)**	**1**
		Serial Nos.: A30205002 – A30206069	
01	BA04073A	Logic P.C.B. Ass'y (U.S.A., Japan, Canada & Others)	1
	BA04109A	Logic P.C.B. Ass'y (UK, Australia & 220V Class 2)	1
02	BA04015B	Main P.C.B. Ass'y	1
03	BA04014A	Record Cal. P.C.B. Ass'y	1
04	BA03976A	Control Switch P.C.B. Ass'y	1
05	BA04013A	Volume P.C.B. Ass'y	1
06	0J04014A	Power Switch Holder	1
07	0B07253A	Power Switch (U.S.A., Canada & Others)	1
	0B07252A	Power Switch (UK & Australia)	1
	0B07271A	Power Switch (Japan)	1
08	0J04013C	P.C.B. Spacer	4
09	0J03976B	Control Switch Holder	1
10	0J04012B	Front Chassis	1
11	0M04051B	Switch Label	1
12	0J03969C	Side Chassis L	1
13	0J03968D	Side Chassis R	1
14	0J03970D	Center Chassis	1
15	0B08580A	Wire Holder 161	3
16	0B08590A	Free Bushing 80mm	1
17	0B08515A	Insu-Lock	15
18	JA03487A	Rear Panel Ass'y (U.S.A. & Canada)	1
	JA03488A	Rear Panel Ass'y (Japan)	1
	JA03490A	Rear Panel Ass'y (Others)	1
	JA03492A	Rear Panel Ass'y (UK)	1
	JA03517A	Rear Panel Ass'y (220V Class 2)	1
	JA03623A	Rear Panel Ass'y (Australia)	1
19	0J04009C	Switch Holder	1
L01	0E00857A	BT Screw M3x6 Philips Binding Head	22
L02	0E00637A	Washer 3.3mm	5
L03	0E00859A	BT Screw M2.6x6 Philips Binding Head	4
L04	0E00502A	Screw M3x5 Philips Pan Head	2
L05	0E00865A	BT Screw M3x10 Philips Binding Head	4
L06	0E00860A	BT Screw M3x6 Philips Binding Head (Black)	6
L07	0E00157A	Washer 3mm (Black Plastics)	6

Schematic Ref. No.	Part No.	Description	Q'ty
B04	**JA03468A**	**Chassis Ass'y 581 (U.S.A. & Canada)**	**1**
	JA03469A	**Chassis Ass'y 581 (Japan)**	**1**
	JA03471A	**Chassis Ass'y 581 (Others)**	**1**
	JA03473A	**Chassis Ass'y 581 (UK)**	**1**
	JA03515A	**Chassis Ass'y 581 (220V Class 2)**	**1**
	JA03622A	**Chassis Ass'y 581 (Australia)**	**1**
		Serial Nos.: A30201001 – A30205001	
01	BA04036A	Logic P.C.B. Ass'y (U.S.A., Japan, Canada & Others)	1
	BA04040A	Logic P.C.B. Ass'y (UK, Australia & 220V Class 2)	1
02	BA04015B	Main P.C.B. Ass'y	1
03	BA04014A	Record Cal. P.C.B. Ass'y	1
04	BA03976A	Control Switch P.C.B. Ass'y	1
05	BA04013A	Volume P.C.B. Ass'y	1
06	0J04014A	Power Switch Holder	1
07	0B07253A	Power Switch (U.S.A., Japan, Canada & Others)	1
	0B07252A	Power Switch (UK, Australia & 220V Class 2)	1
08	0J04013C	P.C.B. Spacer	4
09	0J03976B	Control Switch Holder	1
10	0J04012B	Front Chassis	1
11	0M04051B	Switch Label	1
12	0J03969C	Side Chassis L	1
13	0J03968D	Side Chassis R	1
14	0J03970D	Center Chassis	1
15	0B08580A	Wire Holder 161	3
16	0B08590A	Free Bushing 80mm	1
17	0B08515A	Insu-Lock	15
18	JA03487A	Rear Panel Ass'y (U.S.A. & Canada)	1
	JA03488A	Rear Panel Ass'y (Japan)	1
	JA03490A	Rear Panel Ass'y (Others)	1
	JA03492A	Rear Panel Ass'y (UK)	1
	JA03517A	Rear Panel Ass'y (220V Class 2)	1
	JA03623A	Rear Panel Ass'y (Australia)	1
19	0J04009C	Switch Holder	1
L01	0E00857A	BT Screw M3x6 Philips Binding Head	22
L02	0E00637A	Washer 3.3mm	5
L03	0E00859A	BT Screw M2.6x6 Philips Binding Head	4
L04	0E00502A	Screw M3x5 Philips Pan Head	2
L05	0E00865A	BT Screw M3x10 Philips Binding Head	4
L06	0E00860A	BT Screw M3x6 Philips Binding Head (Black)	6
L07	0E00157A	Washer 3mm (Black Plastics)	6

Schematic Ref. No.	Part No.	Description	Q'ty
C01	**HA03777A**	**Lamp House Cover Ass'y**	**1**
01	0J03977B	Lamp House Cover Holder	1
02	BA03974A	Lamp P.C.B. Ass'y	1
03	0H03673A	Lamp House Cover	1
04	0H03674D	Lamp House	3
L01	0E00853A	BT Screw M2x3 Philips Pan Head	2
L02	0E00793A	BT Screw M2x6 Philips Binding Head	2
D01	**CA08017B**	**Flywheel Holder Ass'y**	**1**
01	0C08013I	Flywheel Holder	1
02	0C08135A	Capstan Motor	1
03	0C08079F	Capstan Motor Pulley	1
L01	0E00226A	Screw M2.6x4 Philips Pan Head	3
L02	0E00626A	Screw M2x3 Cup Point	1
L03	0C08068C	Thrust Screw	2
L04	0C03857A	Lock Nut	2
D02	**CA08065A**	**Sub Mechanism Chassis Ass'y**	1
01	0C08039A	Reel Hub Head	2
02	CA08038B	Reel Hub B Ass'y	2
03	CA08037A	Reel Hub Take-up Ass'y	1
04	CA08064A	Reel Hub Supply Ass'y	1
05	CA08039A	Back Tension Ass'y	1
06	0C08178A	Back Tension Spring	1
07	CA08040A	Idler Ass'y	1
08	0C08127B	Idler Arm Spring	1
09	CA08042A	Brake Arm Ass'y	2
10	0C08030C	Brake Drive Arm	1
11	0C08129A	Brake Arm Spring	1
12	0C08128A	Brake Drive Arm Spring	1
13	0B04042A	Lug Terminal 1L2P	1
14	0B09091A	Ceramic Capacitor 0.01μ 50V	2
15	CA08036A	Reel Motor Ass'y	1
16	CA08034A	Control Motor Ass'y	1
17	0C08053B	Volume Coupler	1
18	0B07240A	Volume Control 10KΩ (B)	1
19	CA08041A	Sub Chassis Ass'y	1
L01	0E00842A	Stopper Ring 2mm	1
L02	0E00837A	Stopper Ring 3mm	2
L03	0E00838A	Stopper Ring 4mm	1
L04	0E00859A	BT Screw M2.6x6 Philips Binding Head	1
L05	0E00226A	Screw M2.6x4 Philips Pan Head	5
L06	0E00843A	BT Screw M3x5 Philips Pan Head	1
L07	–	Volume Nut	(1)
L08	–	Volume Washer	(1)

8.7. Lamp House Cover Ass'y (C01)

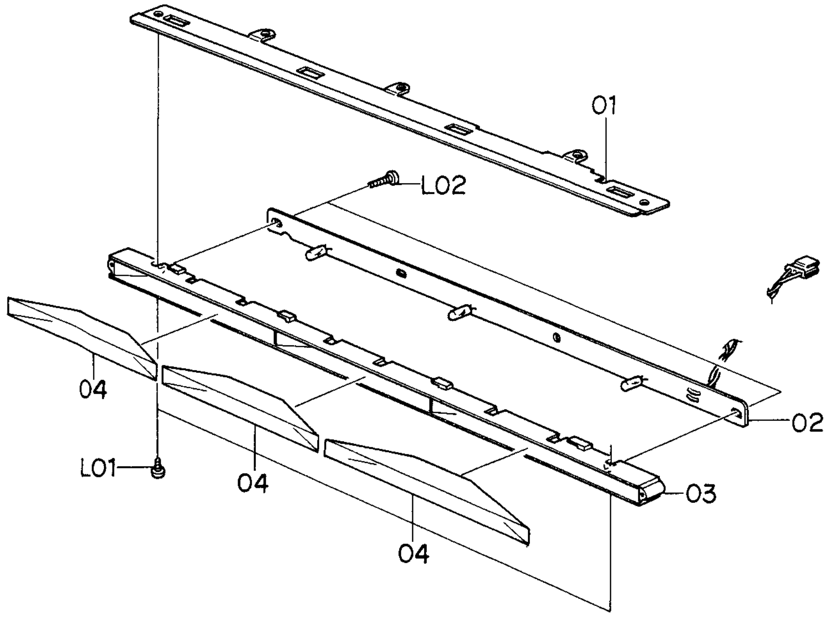

01
L02
04
02
L01
04
03
04

Fig. 8.7

8.8. Flywheel Holder Ass'y (D01)

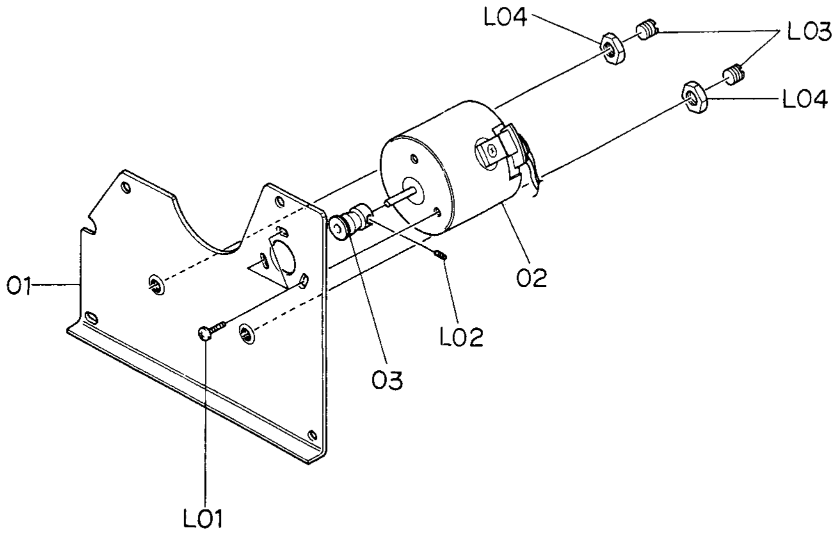
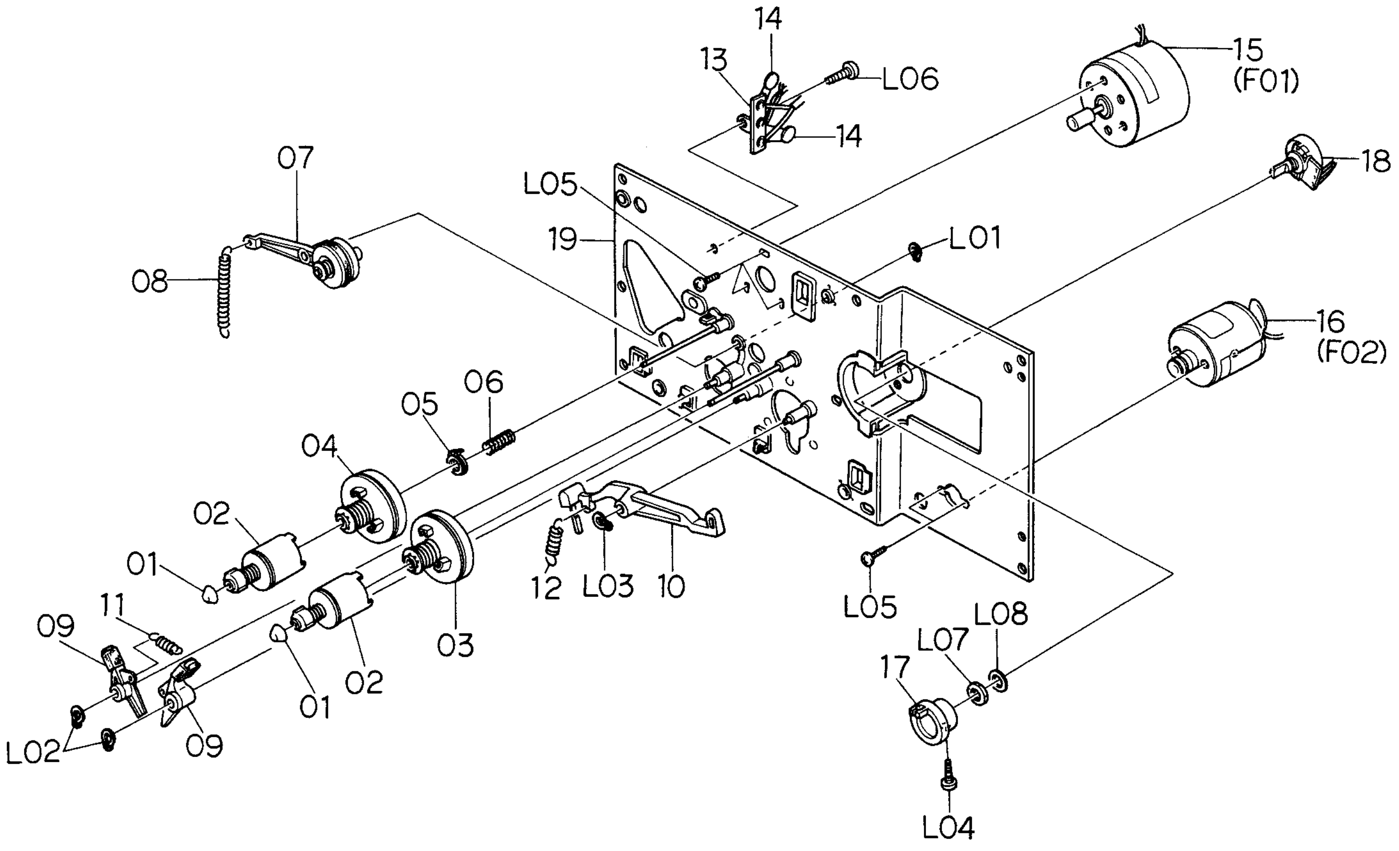

L04
L03
L04
01
02
L02
03
L01

Fig. 8.8

8.9. Sub Mechanism Chassis Ass'y (D02)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L06
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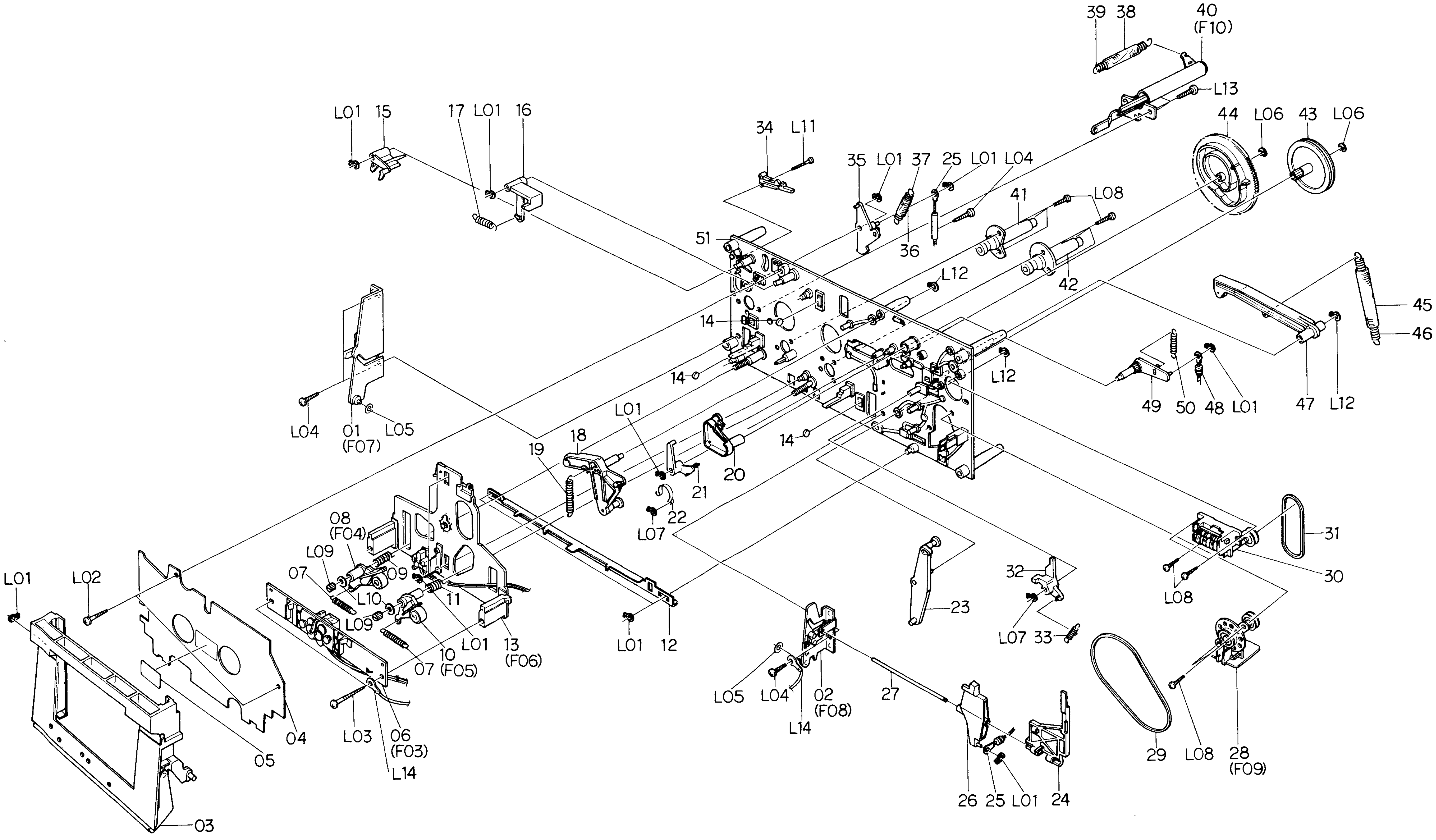
(F01)
14
07
L05
18
19
L01
08
16
(F02)
06
05
04
02
01
12
L03
10
11
L05
09
L08
L07
03
17
01
02
L02
09
L04

Fig. 8.9

8.10. Main Mechanism Chassis Ass'y (D03)


39
38
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L13
44
L06
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L01
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L01
16
34
L11
35
L01
37
25
L01
L04
41
L08
51
36
L12
42
45
46
14
L12
49
50
48
L01
47
L12
L04
01
(F07)
L05
19
18
L01
14
21
20
14
22
L07
08
(F04)
L09
07
09
L10
11
L09
L01
13
(F06)
10
(F05)
07
L01
L02
12
L01
31
30
32
23
L08
L07
33
L05
L04
02
(F08)
L14
27
29
L08
28
(F09)
03
05
04
L03
06
(F03)
L14
26
25
L01
24

Fig. 8.10

Schematic Ref. No.	Part No.	Description	Q'ty
D03	**CA08077B**	**Main Mechanism Chassis Ass'y** Serial No.: A30206790 —	1
01	CA08048A	Cassette Case Holder L Ass'y	1
02	CA08022A	Cassette Case Holder R Ass'y	1
03	CA08055A	Cassette Case Ass'y	1
04	0C08019I	Cover Plate	1
05	0M03977A	Cassette Viewer Label	1
06	CA08056C	Head Mount Base Ass'y	1
07	0C08121A	Supply Pressure Roller Spring	2
08	CA08053B	Supply Pressure Roller Ass'y	1
09	0C08122B	Supply Pressure Roller Thrust Spring	1
10	CA08079A	Take-up Pressure Roller Ass'y	1
11	0C08183B	Take-up Pressure Roller Thrust Spring	1
12	0C08182A	Pressure Roller Drive Bar B	1
13	CA08129A	Head Base Ass'y B	1
14	0C08086B	Head Base Roller	3
15	0C08050B	Record Sensor	1
16	0C08051E	Cassette Hold Arm	1
17	0C08120A	Cassette Hold Arm Spring	1
18	CA08027A	Head Base Drive Arm Ass'y	1
19	0C08143C	Head Base Drive Arm Spring	1
20	CA08025A	Record Arm Ass'y	1
21	0C08038D	Record Trigger	1
22	0C08112A	Flip-Flop Spring	1
23	CA08026A	Pressure Roller Drive Arm Ass'y	1
24	0C08071C	Counter Reset Arm	1
25	0C08124B	Eject Linkage Wire	1
26	0C08057E	Eject Arm	1
27	0C08078B	Arm Shaft	1
28	CA08032B	Auto Shut-off Ass'y	1
29	0C08097B	Counter Belt A	1
30	CA08020A	Counter Ass'y	1
31	0C08098B	Counter Belt B	1
32	0C08067C	Eject Stopper	1
33	0C08134C	Eject Stopper Spring	1
34	0C08119A	Record Protector	1
35	0C08052H	Damper Lock Arm	1
36	0C08153A	Damper Arm Spring Tube	1
37	0C08125A	Damper Arm Spring	1
38	0C08151A	Lid Arm Spring Tube	1
39	0C08114A	Lid Arm Spring	1
40	CA08030A	Pneumatic Damper Ass'y	1
41	CA08023A	Supply Capstan Flange Ass'y	1
42	CA08024A	Take-up Capstan Flange Ass'y	1
43	0C08065D	Cam Drive Gear	1
44	0C08029H	Control Cam	1
45	0C08117A	Counter-Load Arm Spring	1
46	0C08152A	Counter-Load Arm Spring Tube	1
47	CA08028A	Counter-Load Arm Ass'y	1
48	0C08123A	Record Switch Linkage Wire	1
49	0C08037E	Record Arm B	1
50	0C08116A	Record Arm Spring	1
51	CA08072A	Main Chassis Ass'y	1
L01	0E00837A	Stopper Ring 3mm	13
L02	0E00832A	BT Screw M3x14 Philips Pan Head	2
L03	0E00834A	BT Screw M3x30 Philips Pan Head	2
L04	0E00831A	BT Screw M3x10 Philips Pan Head	4
L05	0E00254A	Washer 3.1mm (Plastics)	2
L06	0E00222A	E-Ring 2mm	2
L07	0E00839A	Stopper Ring 2.5mm	2
L08	0E00876A	BT Screw M2.6x8 Philips Pan Head	11
L09	0C08060B	Height Adjustment Nut	2
L10	0E00142A	Washer 2.6mm	2
L11	0E00879A	BT Screw M2x15 Philips Pan Head	1
L12	0E00838A	Stopper Ring 4mm	3
L13	0E00846A	BT Screw M3x8 Philips Pan Head	3
L14	0E00895A	Earth Lug 3mm	2
D03	**CA08077A**	**Main Mechanism Chassis Ass'y** Serial Nos.: A30201001 — A30206789	1
01	CA08048A	Cassette Case Holder L Ass'y	1
02	CA08022A	Cassette Case Holder R Ass'y	1
03	CA08055A	Cassette Case Ass'y	1
04	0C08019I	Cover Plate	1
05	0M03977A	Cassette Viewer Label	1
06	CA08056C	Head Mount Base Ass'y	1
07	0C08121A	Supply Pressure Roller Spring	2
08	CA08053B	Supply Pressure Roller Ass'y	1
09	0C08122B	Supply Pressure Roller Thrust Spring	1
10	CA08079A	Take-up Pressure Roller Ass'y	1
11	0C08183B	Take-up Pressure Roller Thrust Spring	1
12	0C08182A	Pressure Roller Drive Bar B	1
13	CA08129A	Head Base Ass'y B	1
14	0C08086B	Head Base Roller	3
15	0C08050B	Record Sensor	1
16	0C08051E	Cassette Hold Arm	1
17	0C08120A	Cassette Hold Arm Spring	1
18	CA08027A	Head Base Drive Arm Ass'y	1
19	0C08143C	Head Base Drive Arm Spring	1
20	CA08025A	Record Arm Ass'y	1
21	0C08038D	Record Trigger	1
22	0C08112A	Flip-Flop Spring	1
23	CA08026A	Pressure Roller Drive Arm Ass'y	1
24	0C08071C	Counter Reset Arm	1
25	0C08124B	Eject Linkage Wire	1
26	0C08057E	Eject Arm	1
27	0C08078B	Arm Shaft	1
28	CA08032A	Auto Shut-off Ass'y	1
29	0C08097B	Counter Belt A	1
30	CA08020A	Counter Ass'y	1
31	0C08098B	Counter Belt B	1
32	0C08067C	Eject Stopper	1
33	0C08134C	Eject Stopper Spring	1
34	0C08119A	Record Protector	1
35	0C08052H	Damper Lock Arm	1
36	0C08153A	Damper Arm Spring Tube	1
37	0C08125A	Damper Arm Spring	1
38	0C08151A	Lid Arm Spring Tube	1
39	0C08114A	Lid Arm Spring	1
40	CA08030A	Pneumatic Damper Ass'y	1
41	CA08023A	Supply Capstan Flange Ass'y	1
42	CA08024A	Take-up Capstan Flange Ass'y	1
43	0C08065D	Cam Drive Gear	1
44	0C08029H	Control Cam	1
45	0C08117A	Counter-Load Arm Spring	1
46	0C08152A	Counter-Load Arm Spring Tube	1
47	CA08028A	Counter-Load Arm Ass'y	1
48	0C08123A	Record Switch Linkage Wire	1
49	0C08037E	Record Arm B	1
50	0C08116A	Record Arm Spring	1
51	CA08072A	Main Chassis Ass'y	1
L01	0E00837A	Stopper Ring 3mm	13
L02	0E00832A	BT Screw M3x14 Philips Pan Head	2
L03	0E00834A	BT Screw M3x30 Philips Pan Head	2
L04	0E00831A	BT Screw M3x10 Philips Pan Head	4
L05	0E00254A	Washer 3.1mm (Plastics)	2
L06	0E00222A	E-Ring 2mm	2
L07	0E00839A	Stopper Ring 2.5mm	2
L08	0E00876A	BT Screw M2.6x8 Philips Pan Head	11
L09	0C08060B	Height Adjustment Nut	2
L10	0E00142A	Washer 2.6mm	2
L11	0E00879A	BT Screw M2x15 Philips Pan Head	1
L12	0E00838A	Stopper Ring 4mm	3
L13	0E00846A	BT Screw M3x8 Philips Pan Head	3
L14	0E00895A	Earth Lug 3mm	2

8.11. Rear Panel Ass'y (E01)

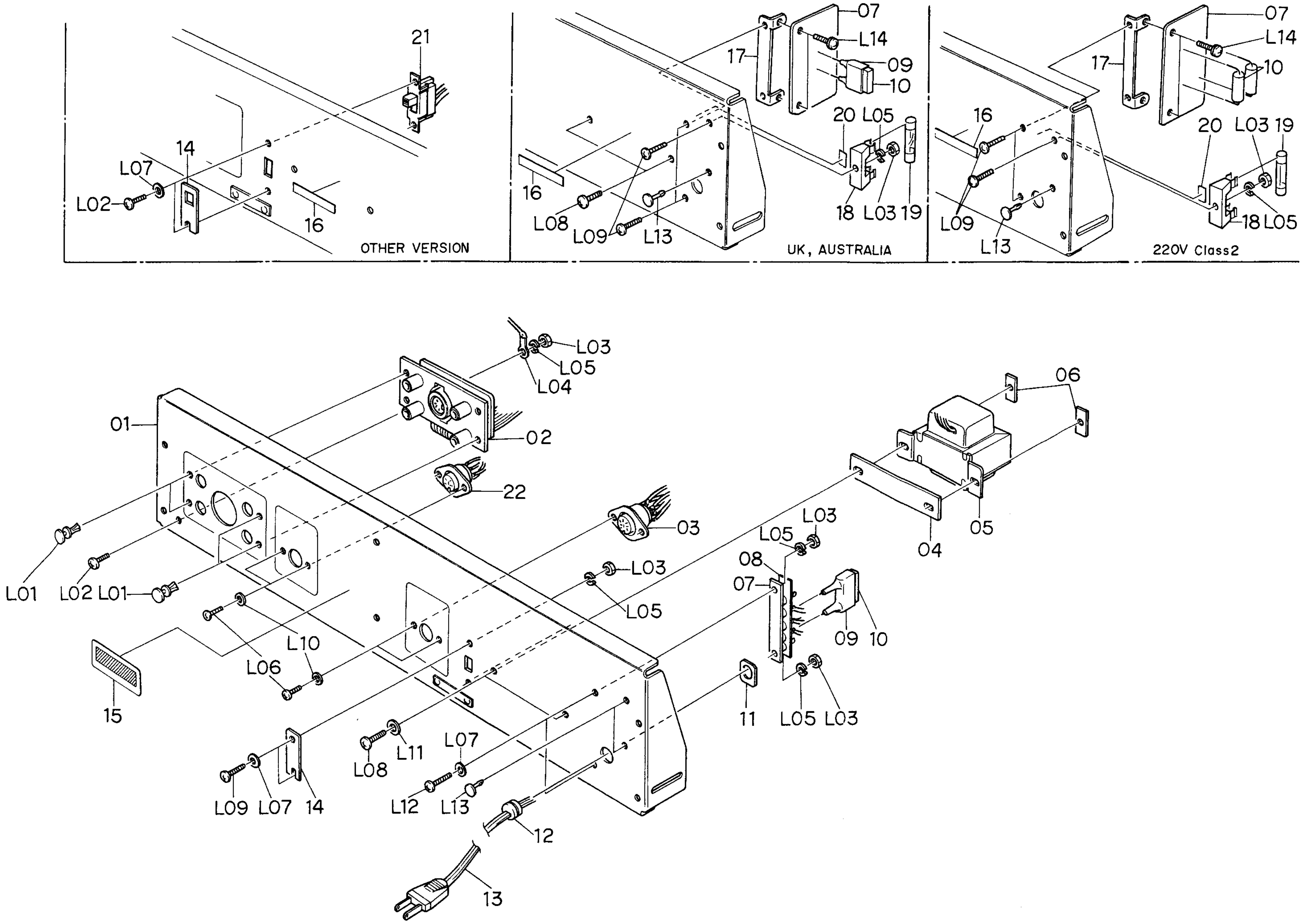

21
14
L07
L02
16
OTHER VERSION
07
L14
17
09
10
20 L05
16
L08
L09
L13
18 L03 19
UK, AUSTRALIA
07
L14
17
10
16
20 L03 19
L09
L13
18 L05
220V Class2
L03
L05
L04
01
02
22
03
06
05
04
L03
L05
08
07
L03
L05
09 10
L01
L02 L01
L10
L06
15
11 L05 L03
L09 L07 14
L11
L07
L08
L12 L13
12
13

Fig. 8.11

Schematic Ref. No.	Part No.	Description	Q'ty
E01	**JA03487A**	**Rear Panel Ass'y (U.S.A. & Canada)**	**1**
	JA03488A	**Rear Panel Ass'y (Japan)**	**1**
	JA03490A	**Rear Panel Ass'y (Others)**	**1**
	JA03492A	**Rear Panel Ass'y (UK)**	**1**
	JA03517A	**Rear Panel Ass'y (220V Class 2)**	**1**
	JA03623A	**Rear Panel Ass'y (Australia)**	**1**
01	0J04010D	Rear Panel	1
02	BA04031A	DIN-Pin P.C.B. Ass'y	1
03	0B08584A	8P DIN Socket	1
04	0J04016A	Transformer Plate	1
05	0B06609A	Power Transformer (U.S.A. & Canada)	1
	0B06610A	Power Transformer (Japan)	1
	0B06611A	Power Transformer (Others)	1
	0B06612A	Power Transformer (UK, Australia & 220V Class 2)	1
06	0C01162B	Bolt Receptacle Plate	2
07	0B08025U	5P Terminal Strip (U.S.A., Canada, Japan & Others)	1
	0B07817A	Terminal P.C.B. C (UK, Australia & 220V Class 2)	1 1
08	0B08555A	5P Terminal Insulator 08 (U.S.A., Canada, Japan & Others)	1
09	0B08359A	Spark Killer Cover (U.S.A., Canada, Japan & Others)	1
10	0B08342A	Spark Killer (U.S.A. & Canada)	1
	0B08363A	Spark Killer (Japan)	1
	0B08240U	Spark Killer (UK, Australia & Others)	1
	0B08445A	Spark Killer (220V Class 2)	1
11	0A03154B	Cord Spacer	1
12	0B08037U	Cord Bushing C (U.S.A., Canada, Japan, 220V Class 2 & Others)	1
	0B08351A	Cord Bushing 4K-4 (UK)	1
	0B08325U	Cord Bushing E (Australia)	1
13	0B08533A	Power Cord (U.S.A., Canada & Others)	1
	0B08219B	Power Cord (Japan)	1
	0B08348A	Power Cord (UK)	1
	0B08093A	Power Cord (220V Class 2)	1
	0B08666A	Power Cord (Australia)	1
14	0J03663A	Switch Cover (U.S.A., Canada, Japan, UK, Australia & 220V Class 2)	1
	0M03946A	Voltage Selector Lock Plate C (Others)	1
15	0M03458A	Pass Label	1
16	0M03794A	Voltage Label 100V (Japan)	1
	0M03796A	Voltage Label 220V (220V Class 2)	1
	0M03797A	Voltage Label 240V (UK & Australia)	1
	0M03955A	Voltage Label 120V/220–240V (Others)	1
17	0J03893A	Terminal P.C.B. Holder B (UK, Australia & 220V Class 2)	1
18	0B08048A	Fuse Holder (UK, Australia & 220V Class 2)	1
19	0B08344A	Fuse 200mA T, 250V (UK, Australia & 220V Class 2)	1
20	0M03968A	Fuse Label 200mA T (UK, Australia & 220V Class 2)	1

Schematic Ref. No.	Part No.	Description	Q'ty
21	0B07092U	Voltage Selector (Others)	1
22	0B08355A	4P DIN Socket	1
—	0M03844B	Power Cord Label (UK & Australia)	1
—	0F01071A	Free-up Belt	1
—	0M03996A	Serial Number Plate	1
—	0M03798A	Nakamichi Label (Japan)	1
—	0M04055A	SDNF Label (220V Class 2)	1
—	0M03865A	SEV Label (220V Class 2)	1
—	0M03697A	Rating Label (220V Class 2)	1
L01	0B08539A	Plastic Rivet	4
L02	0E00593A	Screw M3x6 Philips Binding Head (Bronze)	3
L03	0E00507A	Nut 3mm	6
L04	0E00037A	Earth Lug B-5	1
L05	0E00581A	Washer 3mm Spring	6
L06	0E00714A	Screw M2.6x6 Philips Binding Head (Bronze)	4
L07	0E00157A	Washer 3mm (Black Plastics)	4
L08	0E00756A	Screw M4x8 Philips Binding Head (Bronze)	2
L09	0E00594A	Screw M3x8 Philips Binding Head (Bronze)	5
L10	0E00651A	Washer 2.6mm (Black Plastics)	4
L11	0E00645A	Washer 4mm (Black Plastics)	2
L12	0E00701A	Screw M3x10 Philips Binding Head (Bronze)	2
L13	0B08583A	Plastic Clip	2
L14	0E00510A	Screw M3x8 Philips Pan Head (2A)	2
—	0J03644A	Chobert Rivet	2
F01	**CA08036A**	**Reel Motor Ass'y**	**1**
01	0C08138A	Reel Motor	1
02	0C08063E	Reel Motor Pulley	1
03	0M03902A	Motor Lavel 730	1
04	0M03987A	Motor Seal A	1
L01	0E00672A	Screw M2x2 Cup Point	1
F02	**CA08034A**	**Control Motor Ass'y**	**1**
01	0C08137A	Control Motor	1
02	0C08064A	Control Motor Pulley	1
03	0B01356A	Ceramic Capacitor 0.1μ 50V	1
04	0M03985A	Control Motor Label	1
05	0M03988A	Motor Seal B	1
F03	**CA08056C**	**Head Mount Base Ass'y**	**1**
01	0C08028C	Head Height Adjustment Gear	2
02	0C08027E	Head Height Adjustment Screw	4
03	0C08026D	Azimuth Alignment Screw	2
04	0C08161B	Spring Stopper	2
05	0C08187B	Head Plate Spring	2
06	CA08083C	Head Mount Base Sub Ass'y	1
07	CA08127A	P-8L Playback Head Ass'y	1
08	CA08128A	R-8L Record Head Ass'y	1

8.12. Reel Motor Ass'y (F01)

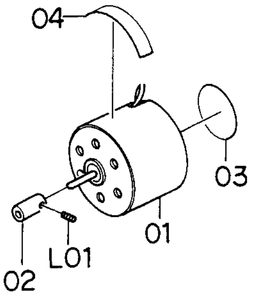


Fig. 8.12

8.13. Control Motor Ass'y (F02)

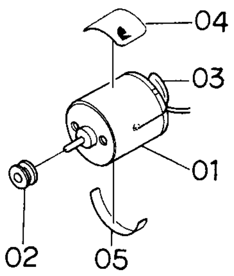


Fig. 8.13

8.14. Head Mount Base Ass'y (F03)

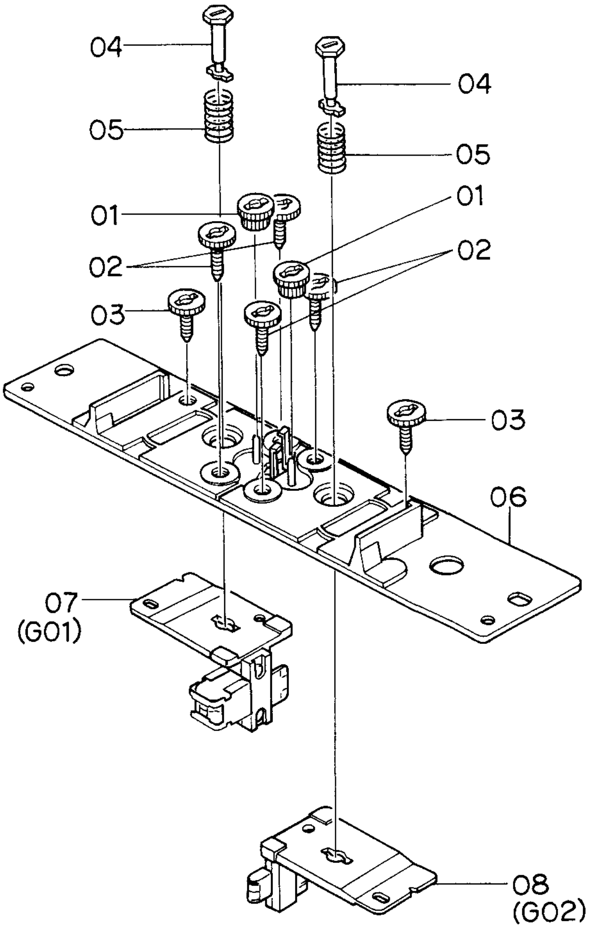


Fig. 8.14

8.15. Supply Pressure Roller Ass'y (F04)

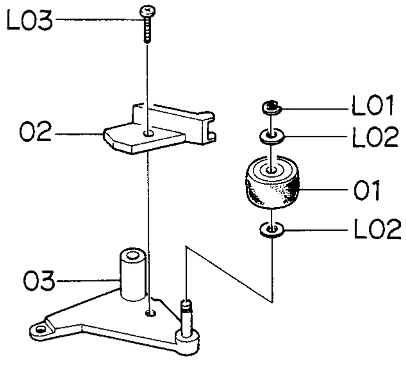

L03
02
L01
L02
01
L02
03

Fig. 8.15

8.16. Take-up Pressure Roller Ass'y (F05)

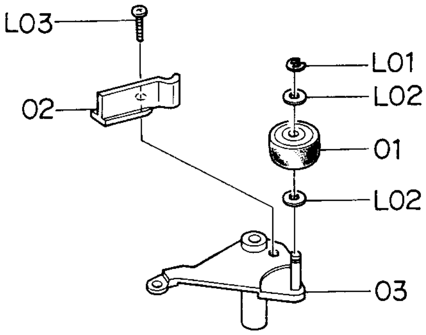

L03
L01
02
L02
01
L02
03

Fig. 8.16

8.17. Head Base Ass'y B (F06)

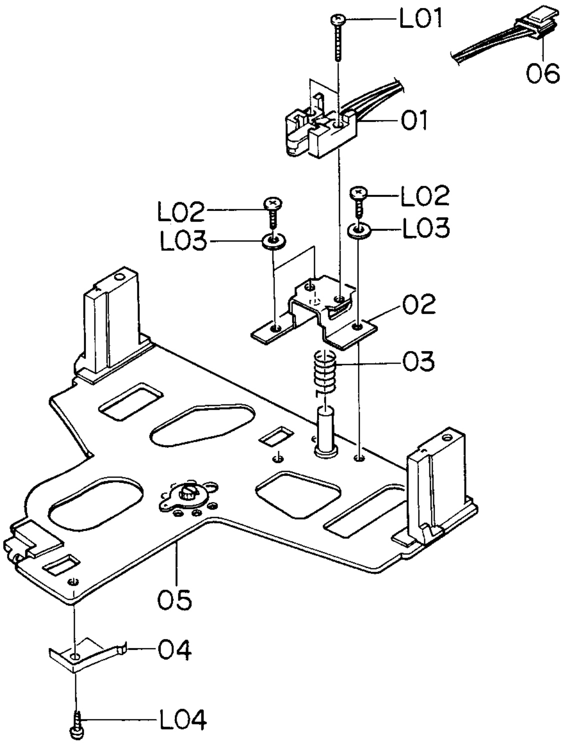

L01
06
01
L02
L02
L03
L03
02
03
05
04
L04

Fig. 8.17

8.18. Cassette Case Holder L Ass'y (F07)

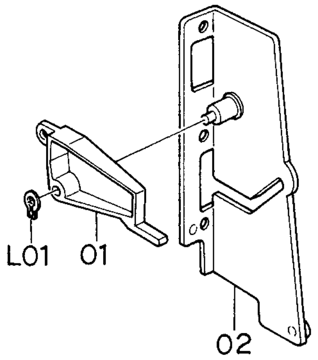


Fig. 8.18

8.19. Cassette Case Holder R Ass'y (F08)

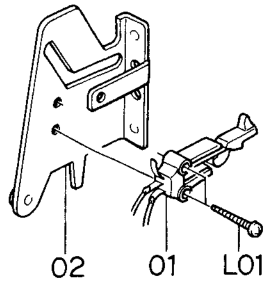


Fig. 8.19

8.20. Auto Shut-off Ass'y (F09)

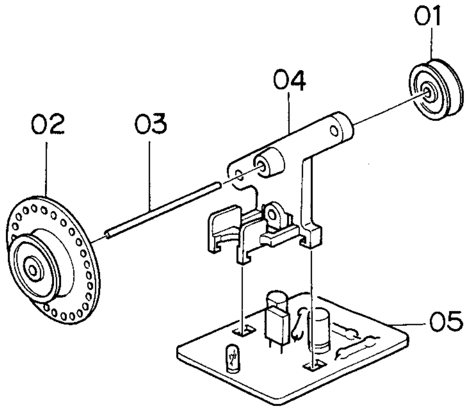

01
04
02
03
05

Fig. 8.20.1 Serial No.: A30206790 –

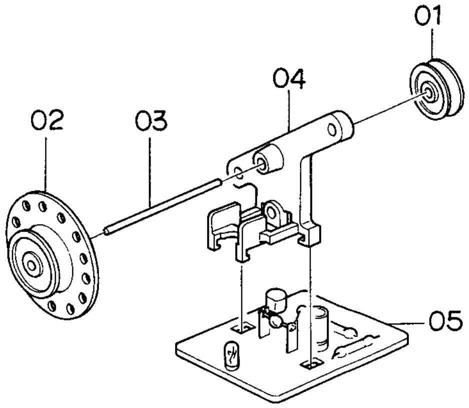

01
04
02
03
05

Fig. 8.20.2
Serial Nos.: A30201001 – A30206789

8.21. Pneumatic Damper Ass'y (F10)

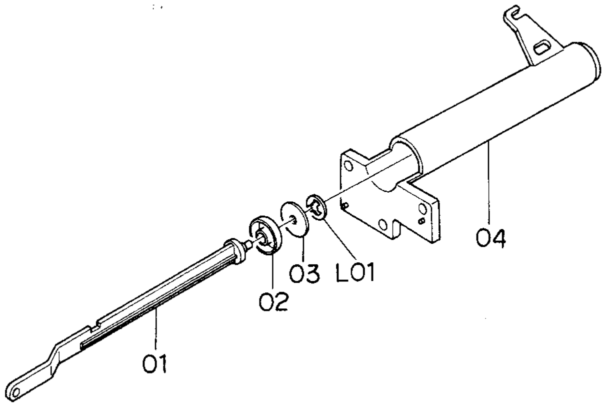


Fig. 8.21

Schematic Ref. No.	Part No.	Description	Q'ty
F04	**CA08053B**	**Supply Pressure Roller Ass'y**	**1**
01	0C08164E	Pressure Roller	1
02	0C08189B	Supply Tape Guide	1
03	CA08061A	Supply Pressure Roller Arm Ass'y	1
L01	0E00042A	E-Ring 1.5mm	1
L02	0C08024A	Washer 2mm	2
L03	0E00788A	BT Screw M2x8 Philips Pan Head	1
F05	**CA08079A**	**Take-up Pressure Roller Ass'y**	**1**
01	0C08164E	Pressure Roller	1
02	0C08181B	Take-up Tape Guide	1
03	CA08073B	Take-up Pressure Roller Arm Ass'y	1
L01	0E00042A	E-Ring 1.5mm	1
L02	0C08024A	Washer 2mm	2
L03	0E00788A	BT Screw M2x8 Philips Pan Head	1
F06	**CA08129A**	**Head Base Ass'y B**	**1**
01	GA02017A	Erase Head E-8L	1
02	0C08158C	EH Hold Plate	1
03	0C08166A	EH Hold Plate Spring	1
04	0C08174C	Cassette Hold Spring	1
05	CA08003P	Head Base Ass'y	1
06	0B08620C	3P-H Connector	1
L01	0E00889A	Screw M1.7x8 Philips Pan Head	2
L02	0E00185A	Screw M2x6 Cylinder Head	3
L03	0E00117A	Washer 2mm	3
L04	0E00794A	BT Screw M2x5 Philips Pan Head	1
F07	**CA08048A**	**Cassette Case Holder L Ass'y**	**1**
01	0C08073C	Lid Arm A	1
02	CA08035A	Cassette Case Holder L Sub Ass'y	1
L01	0E00837A	Stopper Ring 3mm	1

Schematic Ref. No.	Part No.	Description	Q'ty
F08	**CA08022A**	**Cassette Case Holder R Ass'y**	**1**
01	0C08133A	Eject Sensor	1
02	CA08044A	Cassette Case Holder R Sub Ass'y	1
L01	0E00840A	BT Screw M2x8 Philips Pan Head	2
F09	**CA08032B**	**Auto Shut-off Ass'y** Serial No.: A30206790 –	**1**
01	0C08206B	Shut-off Pulley B	1
02	0C08047A	Shut-off Pulley A	1
03	0C08088B	Shut-off Pulley Shaft	1
04	0C08207B	Shut-off Pulley Holder	1
05	BA04076A	Shut-off P.C.B. Ass'y	1
F09	**CA08032A**	**Auto Shut-off Ass'y** Serial Nos.: A30201001 – A30206789	**1**
01	0C08048A	Shut-off Pulley B	1
02	0C08047A	Shut-off Pulley A	1
03	0C08088B	Shut-off Pulley Shaft	1
04	0C08046A	Shut-off Pulley Holder	1
05	BA03975A	Shut-off P.C.B. Ass'y	1
F10	**CA08030A**	**Pneumatic Damper Ass'y**	**1**
01	0C08058C	Damper Piston	1
02	0C08102B	Damper Ring	1
03	0C08010C	Damper Plate	1
04	0C08059E	Sylinder	1
L01	0E00874A	Stopper Ring CS 2mm	1

8.22. P-8L Playback Head Ass'y (G01)

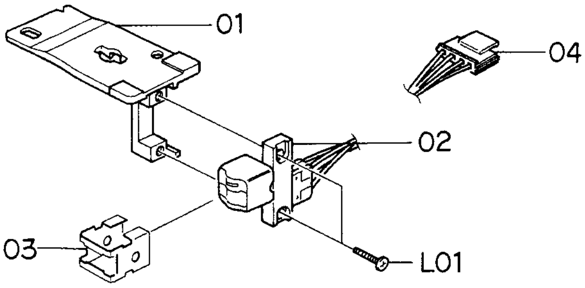


Fig. 8.22

8.23. R-8L Record Head Ass'y (G02)

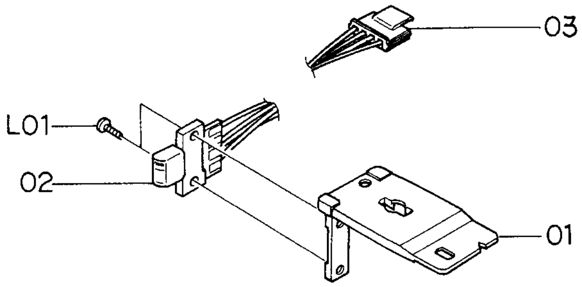


Fig. 8.23

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
G01	**CA08127A**	**P-8L Playback Head Ass'y**	**1**	**G02**	**CA08128A**	**R-8L Record Head Ass'y**	**1**
01	0C08160F	Head Plate	1	01	0C08159G	Head Plate	1
02	GA02034A	P-8L Playback Head	1	02	GA01050A	R-8L Record Head	1
03	0C08169D	Pad Lifter 54	1	03	0B08619C	4P-H Connector B	1
04	0B08618C	4P-H Connector A	1	L01	0E00887A	Screw M1.7x4 Philips Pan Head	2
L01	0E00886A	Screw M1.7x6.5 Philips Pan Head	2				

9. OVERALL TIMING CHART

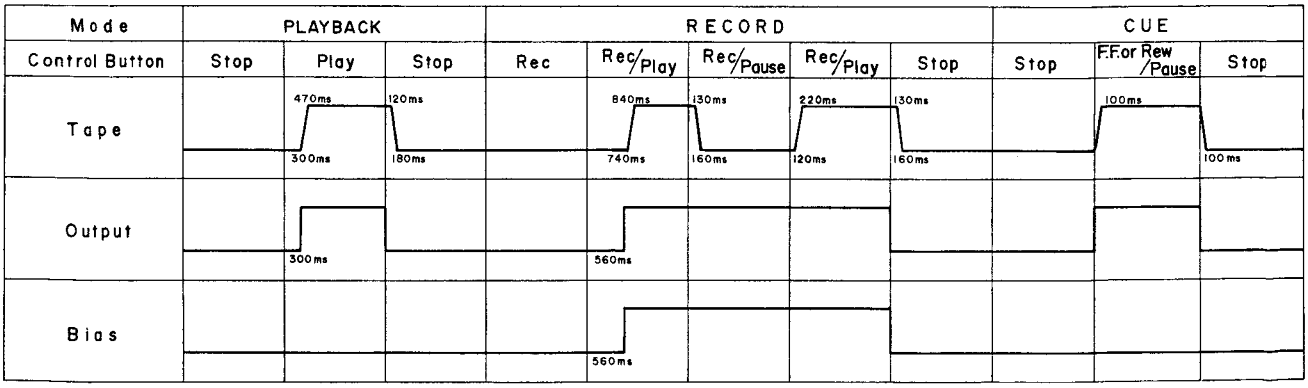


Fig. 9

10. EQ. AMP. FREQUENCY RESPONSE

10.1. Playback Frequency Response

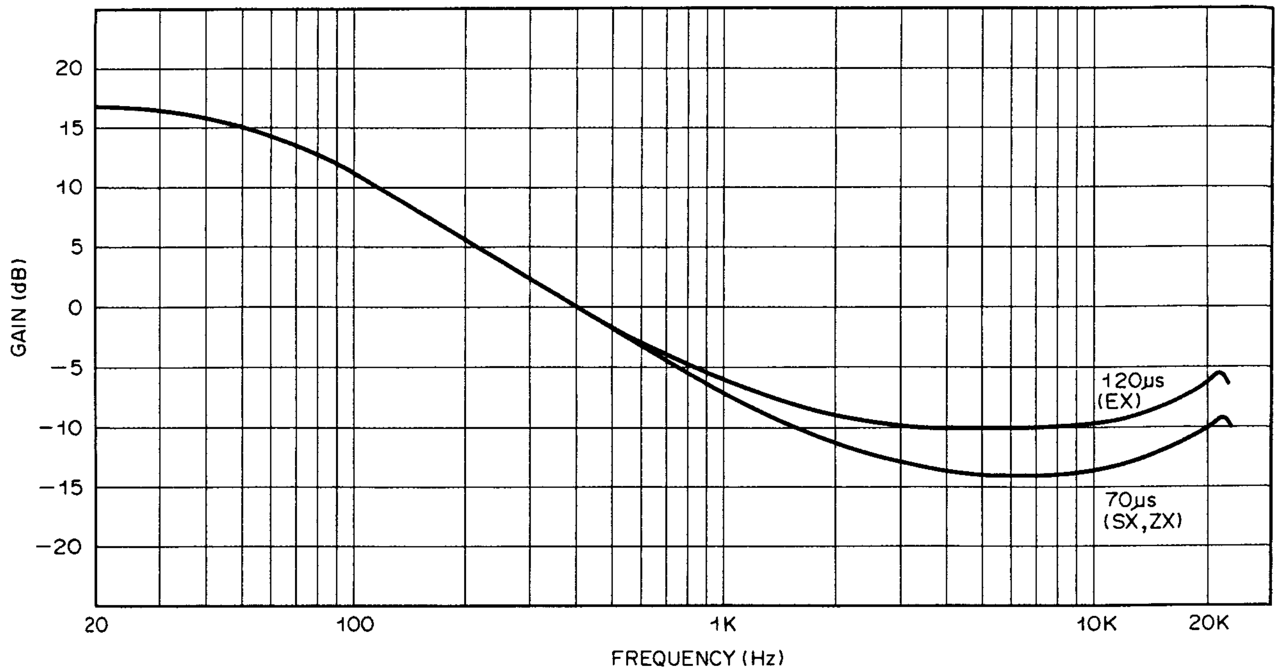


Fig. 10.1

10.2. Record Current Frequency Response

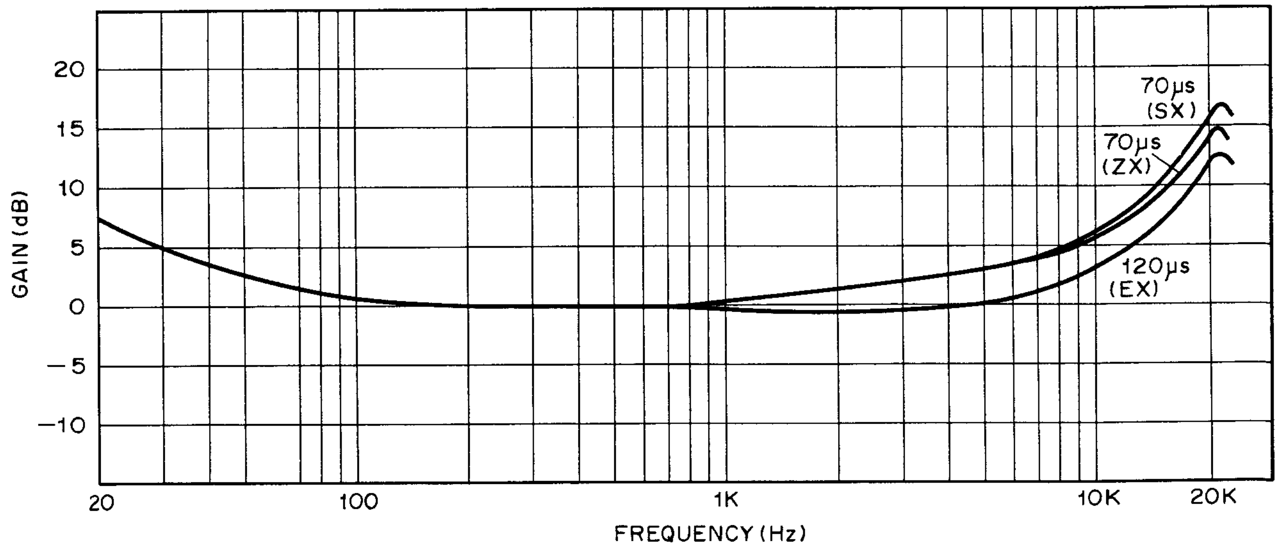
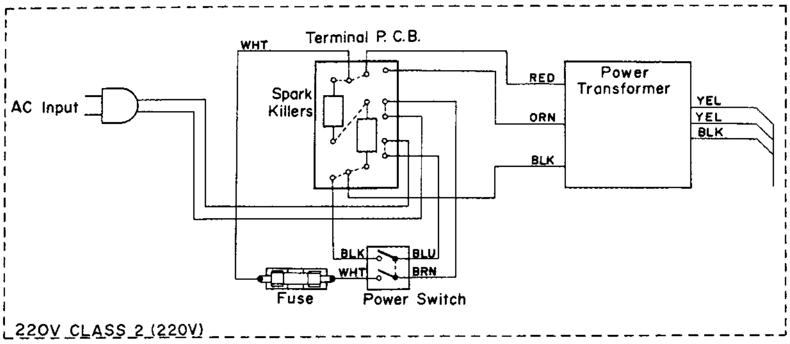
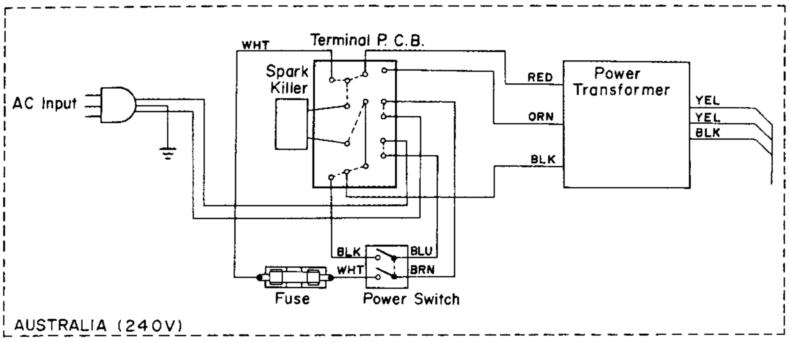
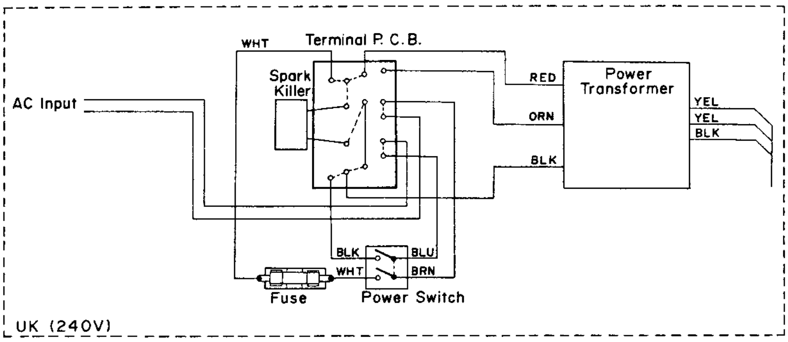


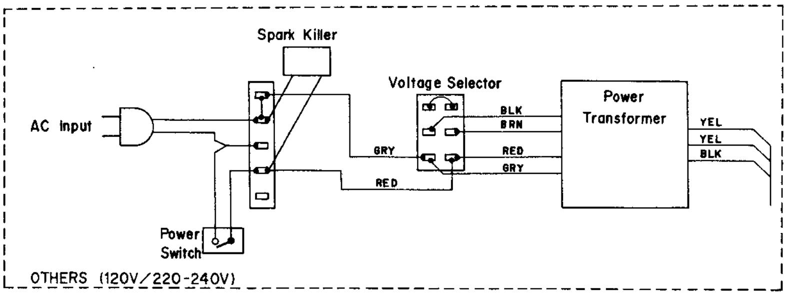
Fig. 10.2

11. WIRING DIAGRAM


Terminal P. C.B.
WHT
Spark Killers
AC Input
RED
ORN
BLK
Power Transformer
YEL
YEL
BLK
BLK
BLU
WHT
BRN
Fuse
Power Switch
220V CLASS 2 (220V)


Terminal P. C.B.
WHT
Spark Killer
AC Input
RED
ORN
BLK
Power Transformer
YEL
YEL
BLK
BLK
BLU
WHT
BRN
Fuse
Power Switch
AUSTRALIA (240V)


Terminal P. C.B.
WHT
Spark Killer
AC Input
RED
ORN
BLK
Power Transformer
YEL
YEL
BLK
BLK
BLU
WHT
BRN
Fuse
Power Switch
UK (240V)


Spark Killer
Voltage Selector
AC Input
BLK
BRN
GRY
RED
GRY
RED
Power Transformer
YEL
YEL
BLK
Power Switch
OTHERS (120V/220-240V)

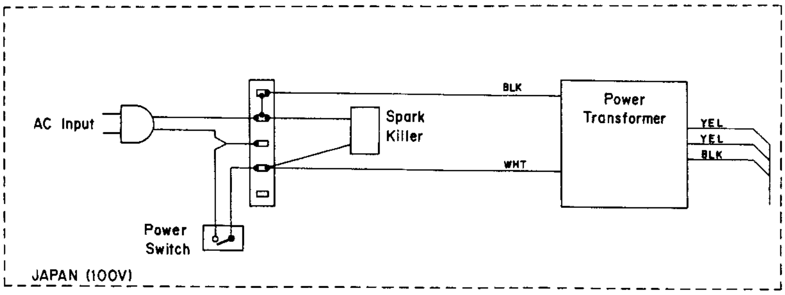
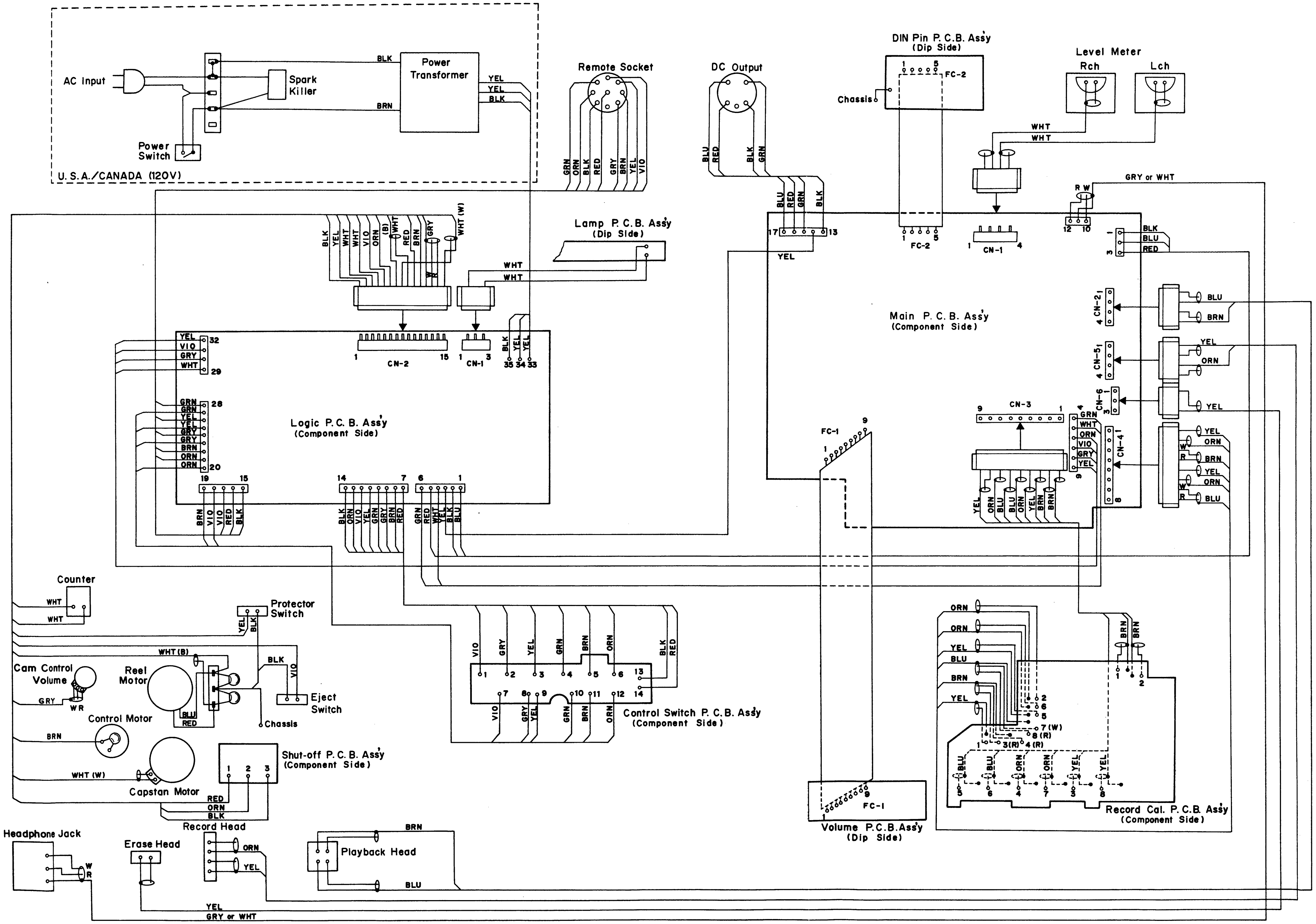

BLK
AC Input
Spark Killer
WHT
Power Transformer
YEL
YEL
BLK
Power Switch
JAPAN (100V)

Fig. 11.1


AC Input
Spark Killer
Power Transformer
Power Switch
U.S.A./CANADA (120V)
BLK
BRN
YEL
Remote Socket
DC Output
DIN Pin P.C.B. Ass'y (Dip Side)
FC-2
Chassis
Level Meter
Rch
Lch
WHT
GRY or WHT
Lamp P.C.B. Ass'y (Dip Side)
Main P.C.B. Ass'y (Component Side)
CN-1
CN-2
CN-3
CN-4
CN-5
CN-6
Logic P.C.B. Ass'y (Component Side)
FC-1
Counter
Protector Switch
Cam Control Volume
Reel Motor
Eject Switch
Control Motor
Chassis
Capstan Motor
Shut-off P.C.B. Ass'y (Component Side)
Control Switch P.C.B. Ass'y (Component Side)
Volume P.C.B.Ass'y (Dip Side)
Record Cal. P.C.B. Ass'y (Component Side)
Headphone Jack
Erase Head
Record Head
Playback Head
BLU
RED
GRN
GRY
ORN
VIO
WHT (W)
WHT (B)
GRY or WHT

Note: Table of wire colors

BLK – Black
BLU – Blue
ORN – Orange

GRY – Gray
GRN – Green
RED – Red

BRN – Brown
YEL – Yellow
WHT – White

Fig. 11.2

12. BLOCK DIAGRAMS

12.1. Amplifier

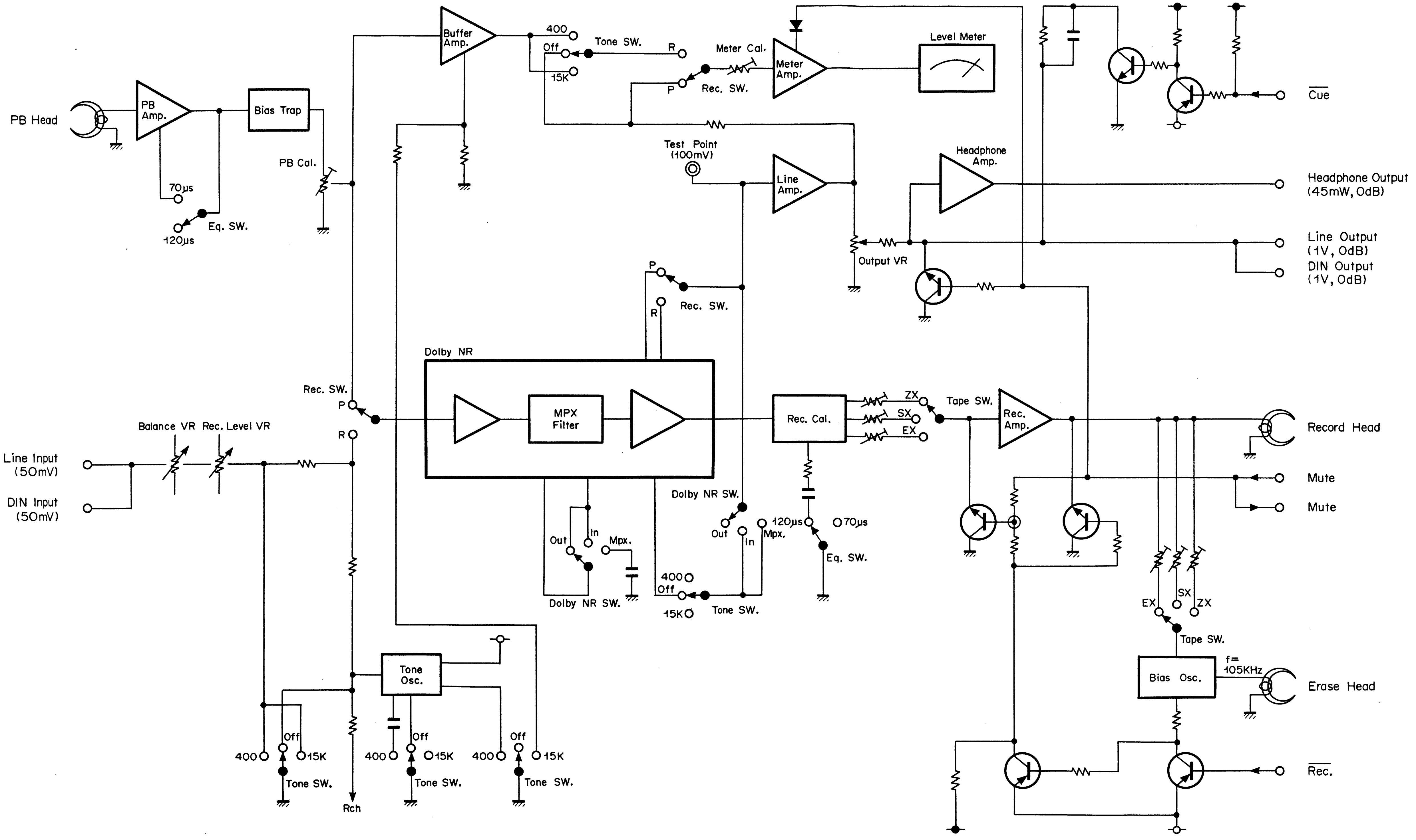

PB Head
PB Amp.
Bias Trap
PB Cal.
70µs
Eq. SW.
120µs
Buffer Amp.
400
Off
15K
Tone SW.
R
Meter Cal.
P
Rec. SW.
Meter Amp.
Level Meter
Cue
Test Point (100mV)
Line Amp.
Headphone Amp.
Headphone Output (45mW, OdB)
Output VR
Line Output (1V, OdB)
DIN Output (1V, OdB)
P
Rec. SW.
R
Dolby NR
MPX Filter
Rec. SW.
P
R
Balance VR
Rec. Level VR
Line Input (50mV)
DIN Input (50mV)
Rec. Cal.
ZX
SX
EX
Tape SW.
Rec. Amp.
Record Head
Mute
Mute
Dolby NR SW.
Out
In
Mpx.
Dolby NR SW.
Out
In
Mpx.
120µs
70µs
Eq. SW.
400
Off
15K
Tone SW.
EX
SX
ZX
Tape SW.
Bias Osc.
f= 105KHz
Erase Head
Tone Osc.
400
Off
15K
Tone SW.
400
Off
15K
Tone SW.
400
Off
15K
Tone SW.
Rch
Rec.

Fig. 12.1.1 Serial No.: A30206060 –

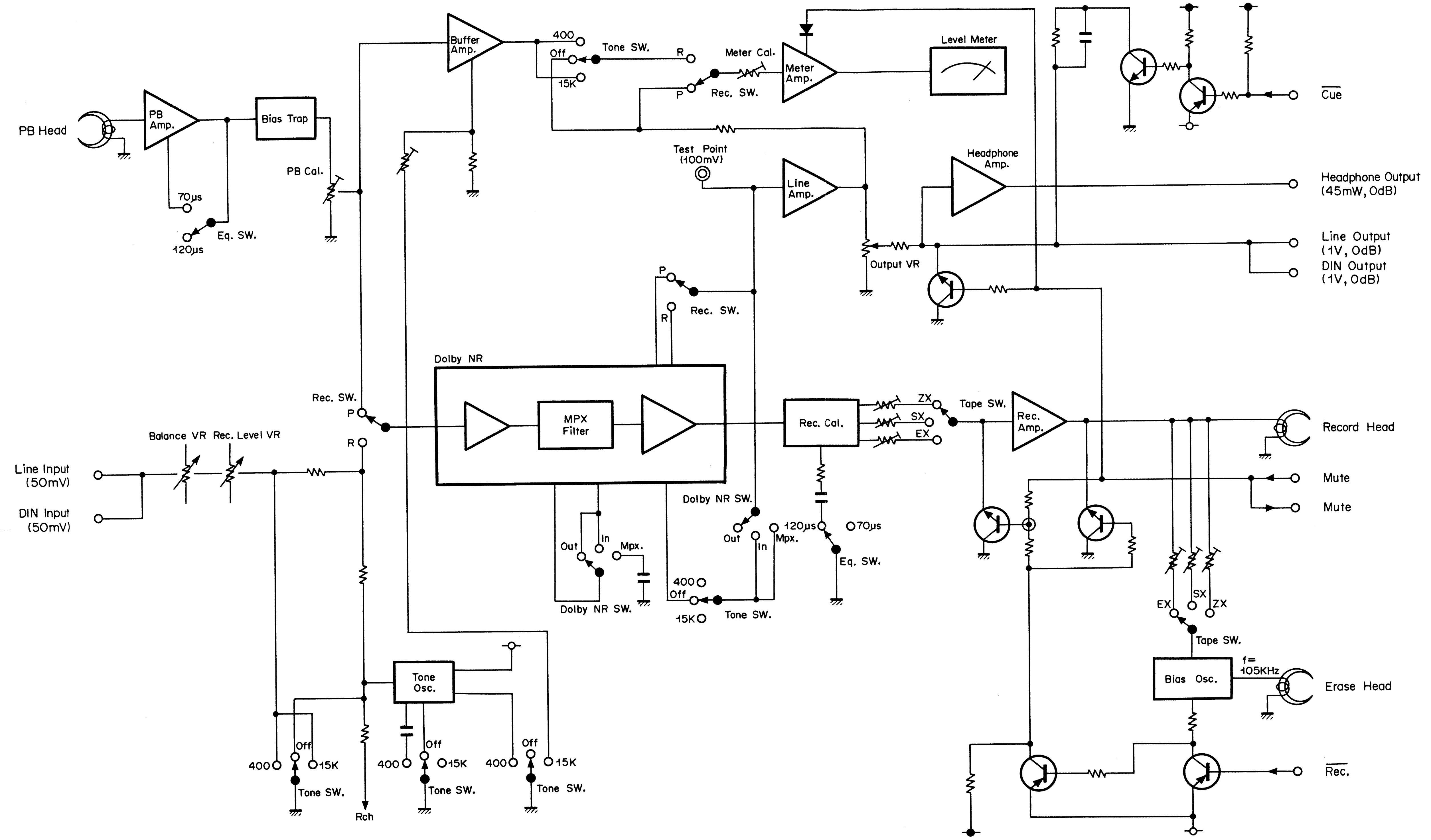

PB Head
PB Amp.
70μs
120μs
Eq. SW.
Bias Trap
PB Cal.
Buffer Amp.
400
Off
15K
Tone SW.
R
P
Meter Cal.
Rec. SW.
Meter Amp.
Level Meter
Test Point (100mV)
Line Amp.
Headphone Amp.
Output VR
Cue
Headphone Output (45mW, OdB)
Line Output (1V, OdB)
DIN Output (1V, OdB)
Rec. SW.
Dolby NR
MPX Filter
Rec. Cal.
ZX
SX
EX
Tape SW.
Rec. Amp.
Record Head
Mute
Mute
Balance VR
Rec. Level VR
Line Input (50mV)
DIN Input (50mV)
Dolby NR SW.
Out
In
Mpx.
120μs
70μs
Eq. SW.
Dolby NR SW.
400
Off
15K
Tone SW.
Tone Osc.
400
Off
15K
Tone SW.
Rch
EX
SX
ZX
Tape SW.
Bias Osc.
f= 105KHz
Erase Head
Rec.

Fig. 12.1.2 Serial Nos.: A30201001 — A30206059

12.2. Mechanism Control

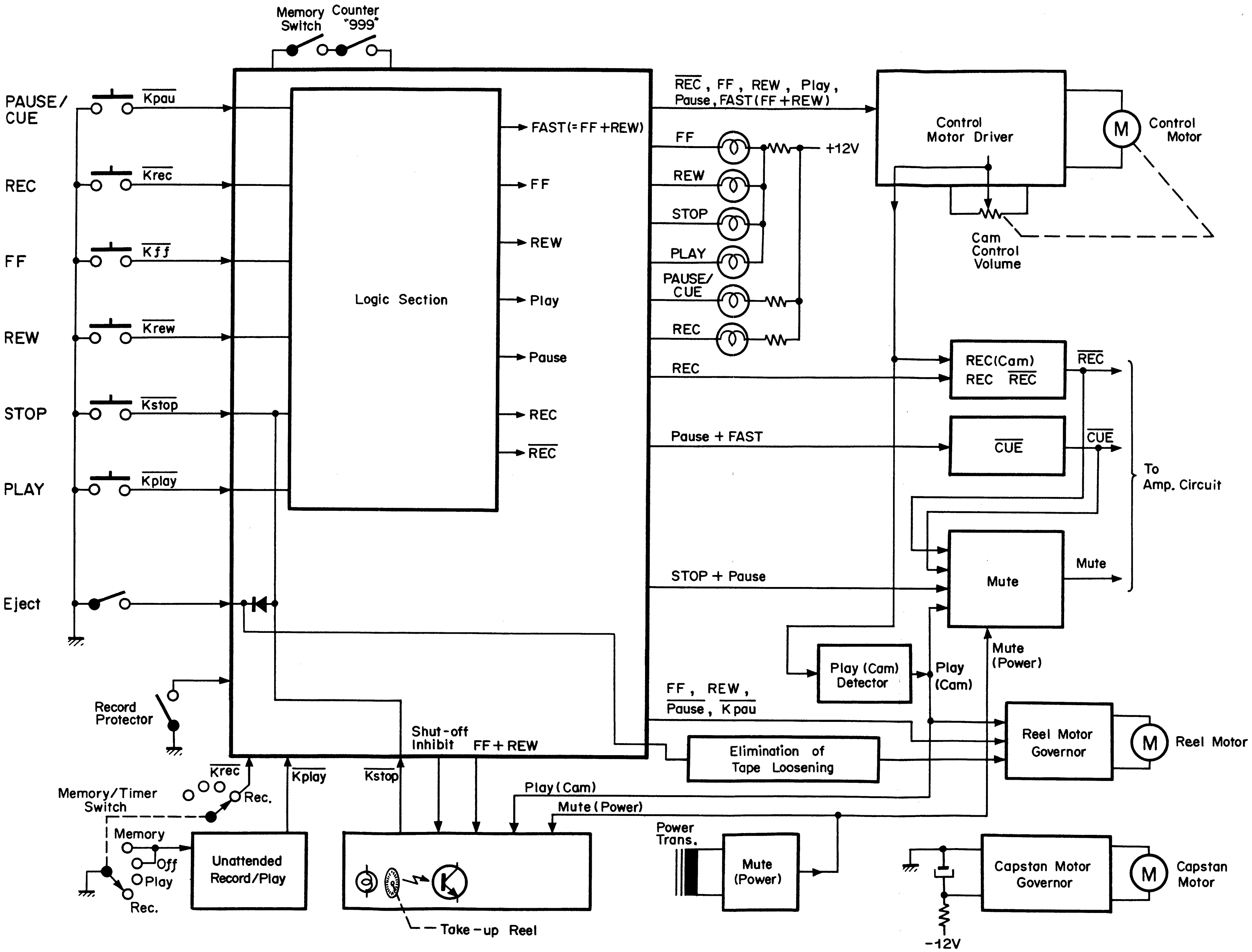

Memory Switch
Counter "999"
PAUSE/ CUE
Kpau
REC
Krec
FF
Kff
REW
Krew
STOP
Kstop
PLAY
Kplay
Eject
Logic Section
FAST(=FF+REW)
FF
REW
Play
Pause
REC
REC
REC, FF, REW, Play, Pause, FAST(FF+REW)
FF
REW
STOP
PLAY
PAUSE/ CUE
REC
+12V
Control Motor Driver
M
Control Motor
Cam Control Volume
REC
REC(Cam)
REC REC
REC
Pause + FAST
CUE
CUE
To Amp. Circuit
STOP + Pause
Mute
Mute
Play (Cam) Detector
Play (Cam)
Mute (Power)
FF, REW, Pause, Kpau
Elimination of Tape Loosening
Reel Motor Governor
M
Reel Motor
Record Protector
Shut-off Inhibit
FF+REW
Krec
Kplay
Kstop
Memory/Timer Switch
Rec.
Memory
Off
Play
Rec.
Unattended Record/Play
Play (Cam)
Mute (Power)
Take-up Reel
Power Trans.
Mute (Power)
Capstan Motor Governor
M
Capstan Motor
-12V

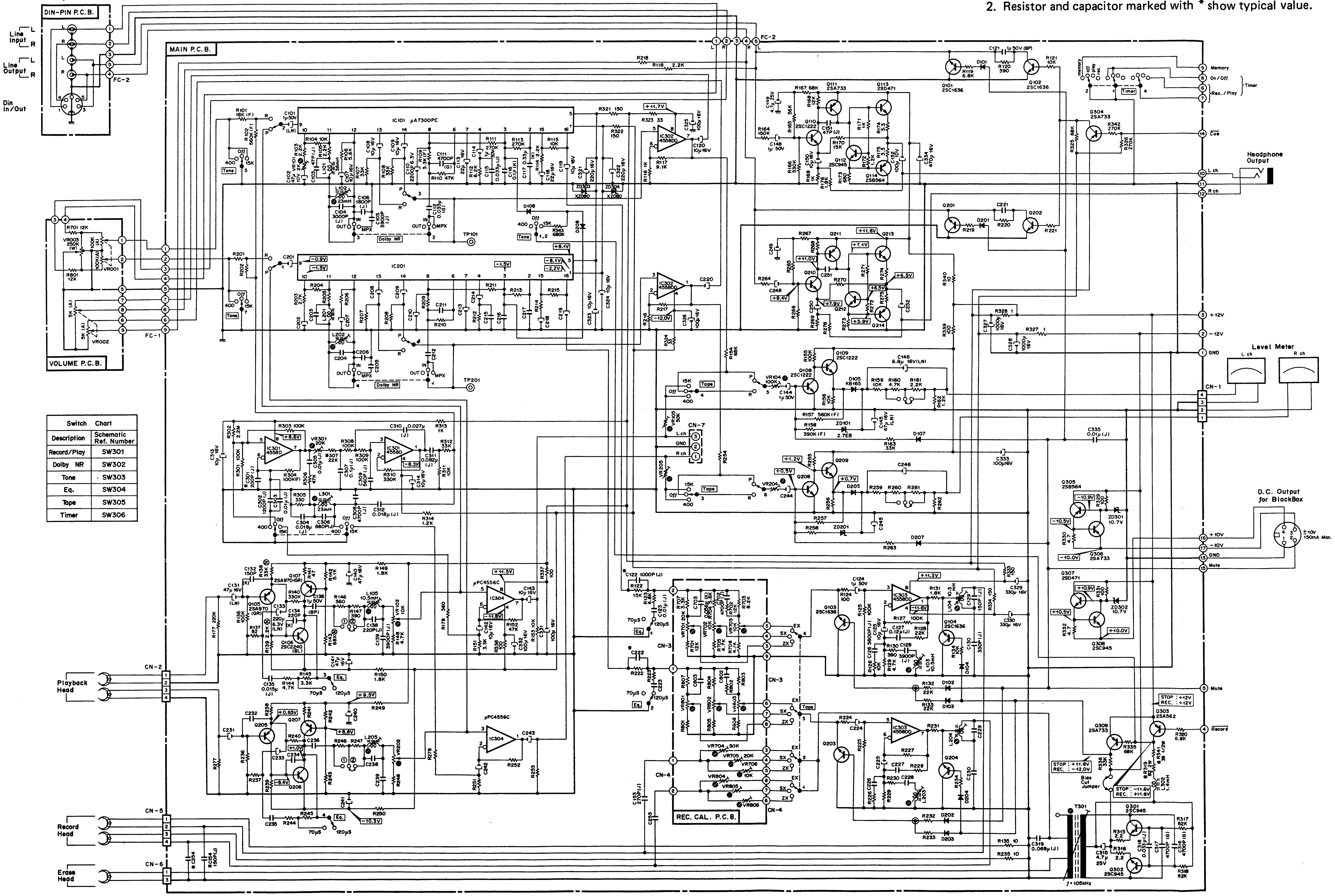
Fig. 12.2

13. SCHEMATIC DIAGRAMS

Note: Refer to diagrams of ICs on page 91.

13.1. Amplifier

Notes: 1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.

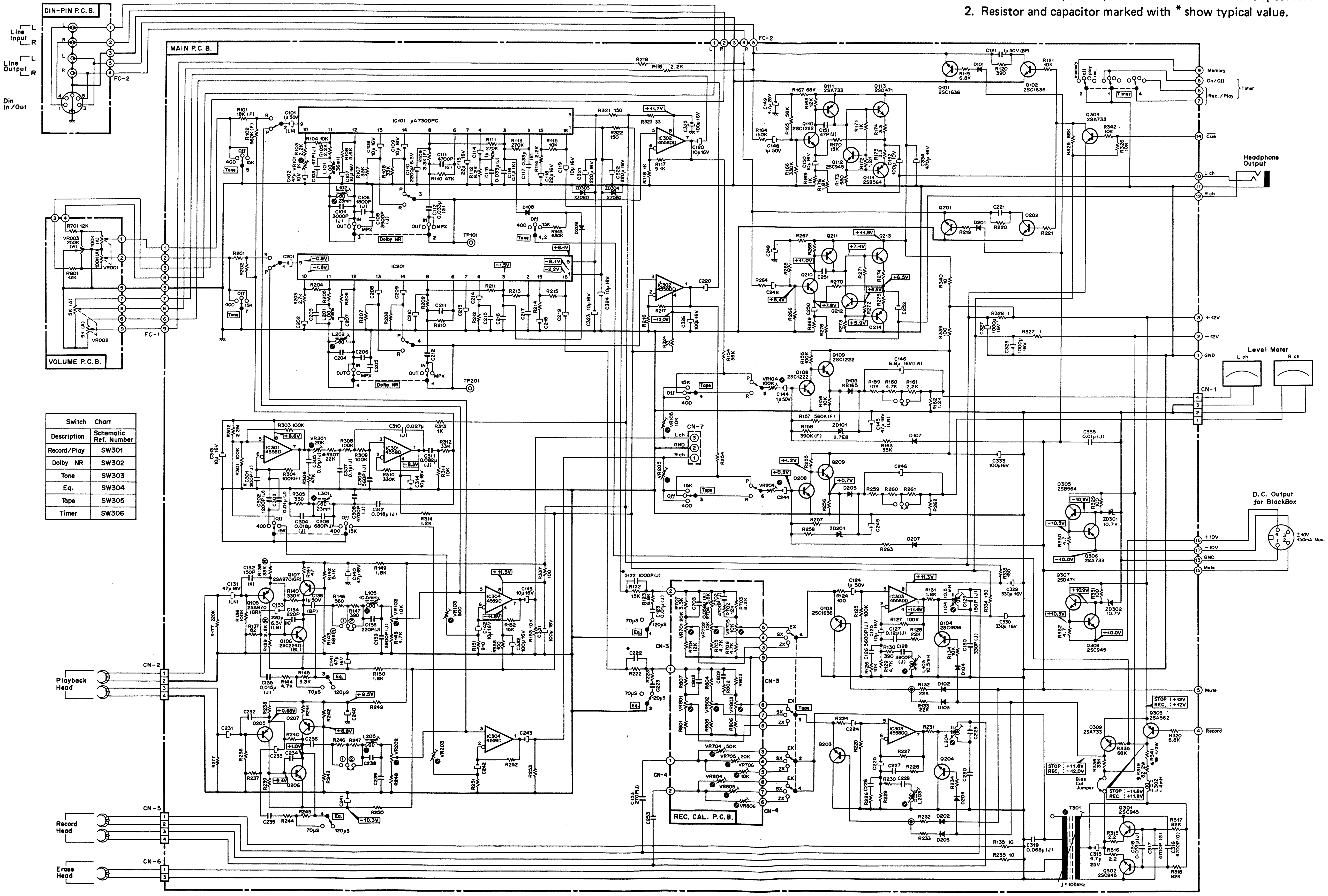


DIN-PIN P.C.B.
Line Input L R
Line Output L R
Din In/Out
FC-2
MAIN P.C.B.
IC101 μA7300PC
IC201
IC302 4558DD
IC301 4558D
IC303 4558DD
IC304 μPC4556C
VOLUME P.C.B.
FC-1
VR003 250K (W)
VR001
VR002
R701 12K
R801 12K
Tone
Dolby NR
OUT
MPX
TP101
TP201
Level Meter
L ch
R ch
Headphone Output
Memory
On/Off
Rec./Play
Timer
Cue
+12V
−12V
GND
CN-1
CN-2
CN-3
CN-4
CN-5
CN-6
CN-7
D.C. Output for BlackBox
+10V
−10V
Mute
Record
±10V 150mA Max.
Playback Head
Record Head
Erase Head
REC. CAL. P.C.B.
Tape
Eq.
70μS
120μS
EX
SX
ZX
T301
f=105kHz
Bias Cut Jumper
STOP : +12V REC. : +12V
Q101 2SC1636
Q102 2SC1636
Q111 2SA733
Q113 2SD471
Q114 2SB564
Q112 2SC945
Q110 2SC1222
Q304 2SA733
Q305 2SB564
Q306 2SA733
Q307 2SD471
Q308 2SC945
Q309 2SA733
Q303 2SA562
Q301 2SC945
Q302 2SC945
Q103 2SC1636
Q104 2SC1636
Q105 2SA970
Q106 2SC2240
Q107 2SA970
Q108 2SC1222
Q109 2SC1222
D105 KB165
ZD101 2.7EB
ZD301 10.7V
ZD302 10.7V

Switch Chart	
Description	Schematic Ref. Number
Record/Play	SW301
Dolby NR	SW302
Tone	SW303
Eq.	SW304
Tape	SW305
Timer	SW306

Fig. 13.1.1 Serial No.: A30206060 –

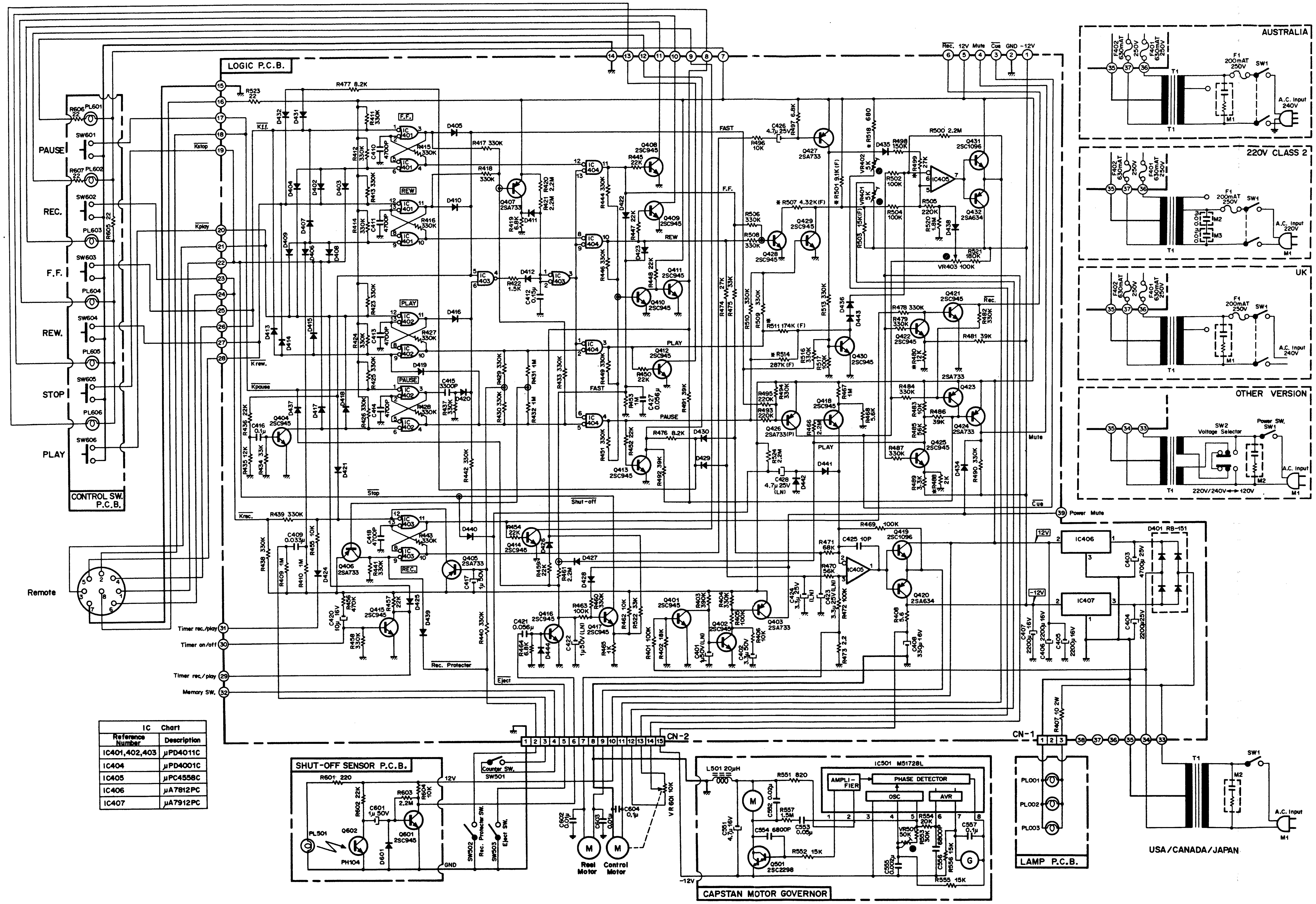
Notes: 1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.


DIN-PIN P.C.B.
Line Input L R
Line Output L R
Din In/Out
FC-2
MAIN P.C.B.
IC101 μA7300PC
IC201
IC302 4558DD
IC301 4558D
IC303 4558DD
IC304 4559D
TP101
TP201
Dolby NR
Tone
MPX
VOLUME P.C.B.
FC-1
CN-7
CN-3
CN-4
REC. CAL. P.C.B.
Playback Head
Record Head
Erase Head
CN-2
CN-5
CN-6
Memory
On/Off
Rec./Play
Timer
Cue
Headphone Output
L ch
R ch
+12V
−12V
GND
Level Meter
CN-1
D.C. Output for BlackBox
+10V
−10V
Mute
Record
+10V 150mA Max.
Tape
Eq.
70μS
120μS
T301
f = 105kHz
Bias Cut Jumper

Switch	Chart
Description	Schematic Ref. Number
Record/Play	SW301
Dolby NR	SW302
Tone	SW303
Eq.	SW304
Tape	SW305
Timer	SW306

Fig. 13.1.2 Serial Nos.: A30201001 – A30206059

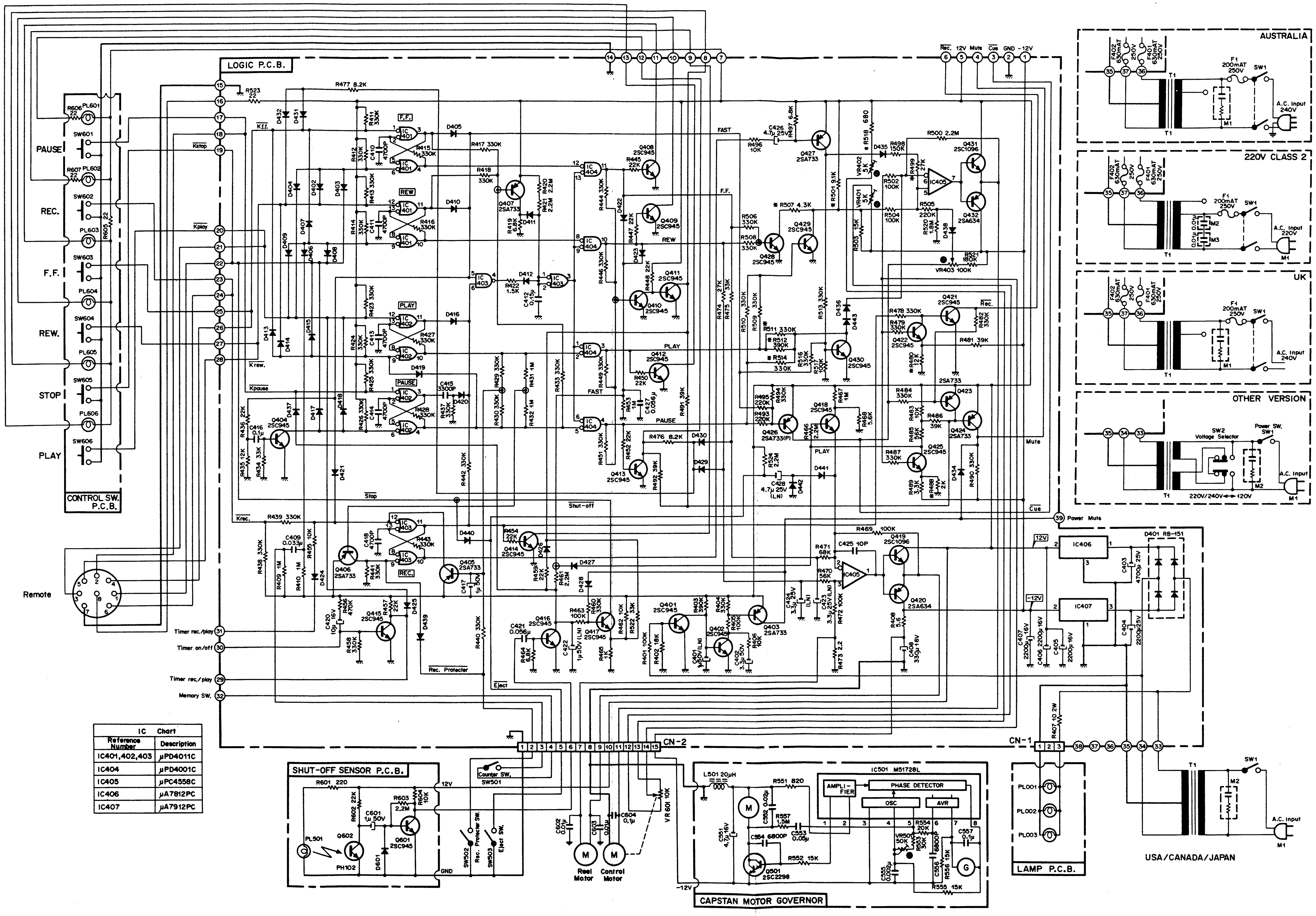
13.2. Mechanism Control


LOGIC P.C.B.
CONTROL SW. P.C.B.
PAUSE
REC.
F.F.
REW.
STOP
PLAY
Remote
Timer rec./play
Timer on/off
Memory SW.
CN-1
CN-2
SHUT-OFF SENSOR P.C.B.
CAPSTAN MOTOR GOVERNOR
LAMP P.C.B.
Reel Motor
Control Motor
AUSTRALIA
220V CLASS 2
UK
OTHER VERSION
USA/CANADA/JAPAN
Power Mute
IC406
IC407
IC501 M51728L
PHASE DETECTOR
OSC
AVR
AMPLI-FIER

IC Chart	
Reference Number	Description
IC401,402,403	µPD4011C
IC404	µPD4001C
IC405	µPC4558C
IC406	µA7812PC
IC407	µA7912PC

Fig. 13.2.1
Serial No.: A30206790 –

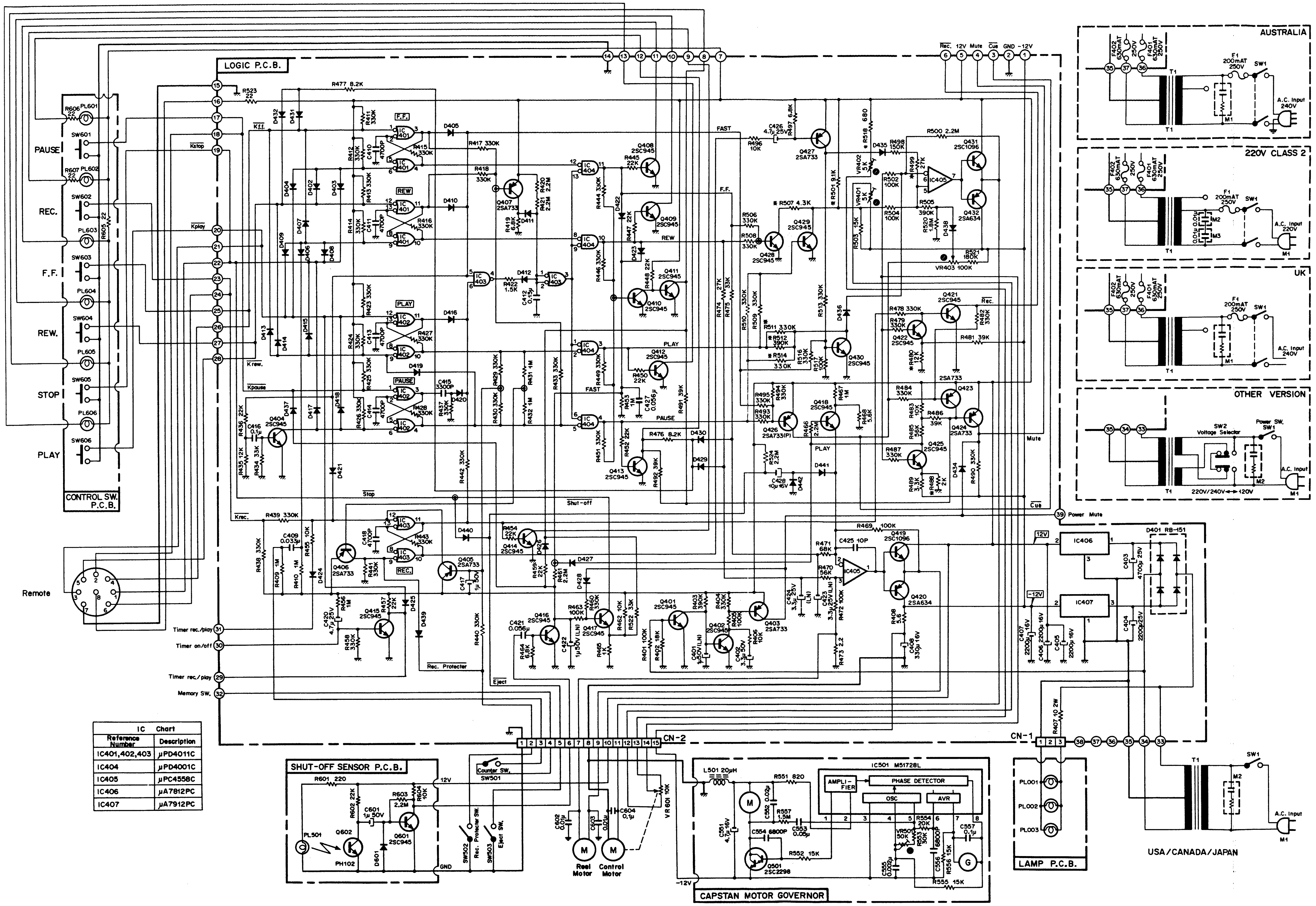
Notes: 1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor marked with * shows typical value.


LOGIC P.C.B.
CONTROL SW. P.C.B.
PAUSE
REC.
F.F.
REW.
STOP
PLAY
Remote
Timer rec./play
Timer on/off
Timer rec./play
Memory SW.
CN-2
CN-1
SHUT-OFF SENSOR P.C.B.
CAPSTAN MOTOR GOVERNOR
LAMP P.C.B.
Reel Motor
Control Motor
Counter SW. SW501
Rec. Protecter SW. SW502
Eject SW. SW503
IC501 M51728L
PHASE DETECTOR
AMPLI-FIER
OSC
AVR
AUSTRALIA
220V CLASS 2
UK
OTHER VERSION
USA/CANADA/JAPAN
A.C. Input
Power Mute
Mute
Cue
FAST
PLAY
PAUSE
REW
Stop
Shut-off
Eject
Rec. Protecter

IC Chart	
Reference Number	Description
IC401,402,403	μPD4011C
IC404	μPD4001C
IC405	μPC4558C
IC406	μA7812PC
IC407	μA7912PC

Fig. 13.2.2
Serial Nos.: A30205002 – A30206789

Notes: 1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor marked with * shows typical value.


LOGIC P.C.B.
CONTROL SW. P.C.B.
PAUSE
REC.
F.F.
REW.
STOP
PLAY
Remote
Timer rec./play
Timer on/off
Timer rec./play
Memory SW.
AUSTRALIA
220V CLASS 2
UK
OTHER VERSION
Power Mute
Mute
CN-1
CN-2
SHUT-OFF SENSOR P.C.B.
Counter SW.
Rec. Protector SW.
Eject SW.
Reel Motor
Control Motor
CAPSTAN MOTOR GOVERNOR
IC501 M51728L
AMPLIFIER
PHASE DETECTOR
OSC
AVR
LAMP P.C.B.
USA/CANADA/JAPAN
A.C. Input

IC Chart	
Reference Number	Description
IC401,402,403	µPD4011C
IC404	µPD4001C
IC405	µPC4558C
IC406	µA7812PC
IC407	µA7912PC

Fig. 13.2.3
Serial Nos.: A30201001 – A30205001

Notes: 1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor marked with * shows typical value.

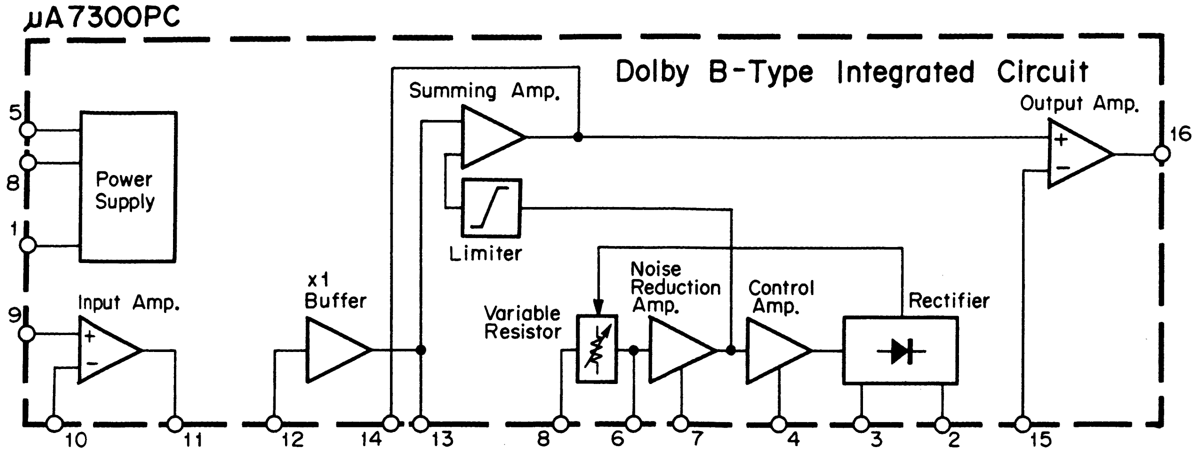

μA7300PC
Dolby B-Type Integrated Circuit
Summing Amp.
Output Amp.
Power Supply
Limiter
Input Amp.
x1 Buffer
Noise Reduction Amp.
Control Amp.
Variable Resistor
Rectifier
5
8
1
9
16
10
11
12
14
13
8
6
7
4
3
2
15

Fig. 13.3 Dolby NR IC μA7300PC

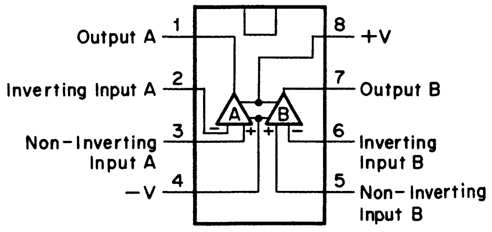

Output A
Inverting Input A
Non-Inverting Input A
−V
+V
Output B
Inverting Input B
Non-Inverting Input B
1
2
3
4
5
6
7
8
A
B

Fig. 13.4 Operational Amp. IC 4558

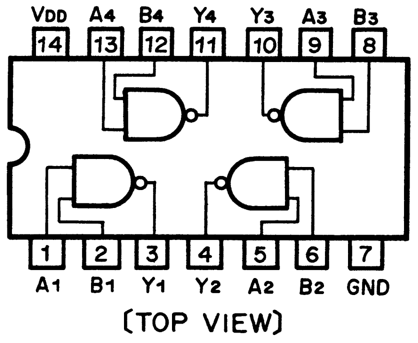

VDD A4 B4 Y4 Y3 A3 B3
14 13 12 11 10 9 8
1 2 3 4 5 6 7
A1 B1 Y1 Y2 A2 B2 GND
(TOP VIEW)

Fig. 13.5 C-MOS IC μPD4011C

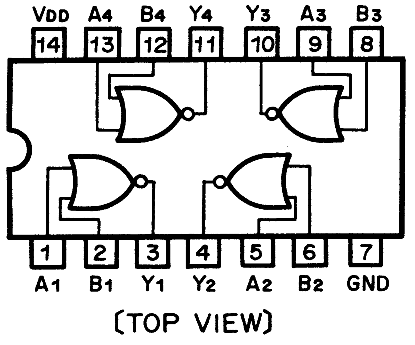

VDD A4 B4 Y4 Y3 A3 B3
14 13 12 11 10 9 8
1 2 3 4 5 6 7
A1 B1 Y1 Y2 A2 B2 GND
(TOP VIEW)

Fig. 13.6 C-MOS IC μPD4001C

14. REMOTE CONTROL UNIT RM-580 (OPTIONAL)

Refer to item 2.4, principle of operation of RM-580.

14.1. Mounting Diagrams

Note: Mounting diagram shows a dip side view of the printed circuit board.

14.1.1. Receiver

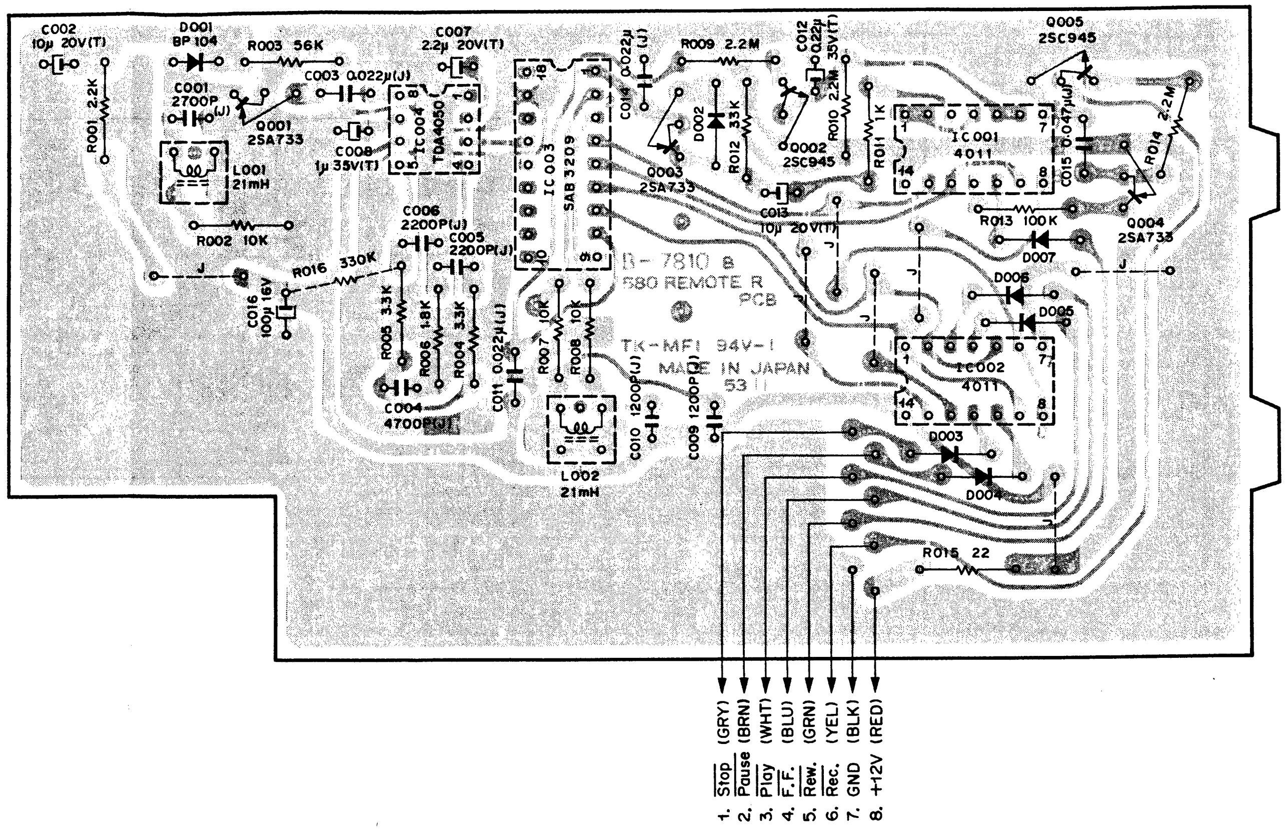

C002 10μ 20V(T)
D001 BP104
R003 56K
C007 2.2μ 20V(T)
C014 0.022μ(J)
R009 2.2M
C012 0.22μ 35V(T)
Q005 2SC945
R001 2.2K
C001 2700P(J)
C003 0.022μ(J)
Q001 2SA733
C008 1μ 35V(T)
IC004 TDA4050
IC003 SAB3209
D002
R012 3.3K
Q002 2SC945
R010 2.2M
R011 1K
IC001 4011
C015 0.047μ(J)
R014 2.2M
L001 21mH
Q003 2SA733
C006 2200P(J)
C005 2200P(J)
R002 10K
R016 330K
C013 10μ 20V(T)
R013 100K
Q004 2SA733
D007
D006
D005
IC002 4011
D003
D004
R015 22
C016 100μ 16V
R005 3.3K
R006 1.8K
R004 3.3K
C011 0.022μ(J)
R007 10K
R008 10K
C004 4700P(J)
C010 1200P(J)
C009 1200P(J)
L002 21mH
B-7810 B
580 REMOTE R PCB
TK-MF1 94V-1
MADE IN JAPAN
53
1. Stop (GRY)
2. Pause (BRN)
3. Play (WHT)
4. F.F. (BLU)
5. Rew. (GRN)
6. Rec. (YEL)
7. GND (BLK)
8. +12V (RED)

Fig. 14.1.1

Schematic Ref. No.	Part No.	Description
	BA04002A	**Remote Receiver P.C.B. Ass'y**
	0B07810B	Remote Receiver P.C.B.
IC001,002	0B06178A	IC μPD4011C
IC003	0B06162A	IC SAB3209
IC004	0B06163A	IC TDA4050
Q001,003 004	0B06013A	Transistor 2SA733
Q002,005	0B06100A	Transistor 2SC945
D001	0B06165A	Photo Diode BP104
D002,003 004,005 006,007	0B01909A	Silicon Diode 1S1555
L001,002	0B06588A	Coil 21mH
R001	0B05622A	Carbon Resistor 2.2K ERD-25T J
R002,007 008	0B01888A	Carbon Resistor 10K ERD-25T J
R003	0B05508A	Carbon Resistor 56K ERD-25T J
R004,005	0B01681A	Carbon Resistor 3.3K ERD-25T J
R006	0B05614A	Carbon Resistor 1.8K ERD-25T J
R009,010 014	0B05671A	Carbon Resistor 2.2M ERD-25T J
R011	0B01857A	Carbon Resistor 1K ERD-25T J
R012	0B05509A	Carbon Resistor 33K ERD-25T J
R013	0B01889A	Carbon Resistor 100K ERD-25T J
R015	0B05579A	Carbon Resistor 22 ERD-25T J
R016	0B05627A	Carbon Resistor 330K ERD-25T J
C001	0B09231A	SP Capacitor 2700P 50V J
C002,013	0B05581A	Tantalum Capacitor 10μ 20V
C003,011 014	0B09291A	Ceramic Capacitor 0.022μ 50V J
C004	0B05652A	Mylar Capacitor 4700P 50V J
C005,006	0B01802A	Mylar Capacitor 2200P 50V J
C007	0B05598A	Tantalum Capacitor 2.2μ 20V
C008	0B05638A	Tantalum Capacitor 1μ 35V
C009,010	0B05790A	SP Capacitor 1200P 50V J
C012	0B05772A	Tantalum Capacitor 0.22μ 35V
C015	0B05796A	Mylar Capacitor 0.047μ 50V J
C016	0B01400A	Electrolytic Capacitor 100μ 16V
	0B08610A	Shield Plate N604 (1 pce.)
	0B03924A	Gate Pin (2 pcs.)

14.1.2. Transmitter

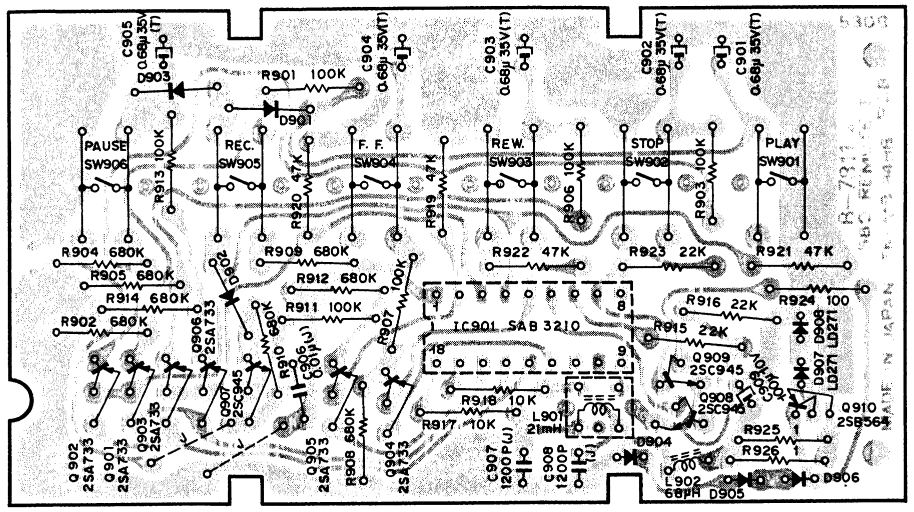

PAUSE SW906
REC. SW905
F. F. SW904
REW. SW903
STOP SW902
PLAY SW901
R901 100K
D901
D903
C905 0.68μ 35V(T)
C904 0.68μ 35V(T)
C903 0.68μ 35V(T)
C902 0.68μ 35V(T)
C901 0.68μ 35V(T)
R904 680K
R905 680K
R914 680K
R902 680K
R909 680K
R912 680K
R911 100K
R922 47K
R923 22K
R921 47K
R924 100
R916 22K
R915 22K
IC901 SAB 3210
Q909 2SC945
Q908 2SC945
Q910 2SB564
R918 10K
R917 10K
L901 21mH
L902 68μH
D904
D905
D906
D907 D908 LD271
R925 1
R926 1
C907 1200P
C908 1200P
Q902 2SA733
Q901 2SA733
Q903 2SA733
Q904 2SA733
Q905 2SA733
Q906 2SA733
Q907 2SC945

Fig. 14.1.2

Schematic Ref. No.	Part No.	Description
	BA04004A	**Remote Transmitter P.C.B. Ass'y**
	0B07811A	Remote Transmitter P.C.B.
IC901	0B06161A	IC SAB3210
C901,902 903,904 905,906	0B06013A	Transistor 2SA733
Q907,908 909	0B06100A	Transistor 2SC945
Q910	0B06069A	Transistor 2SB564
D901,902 903,904 905,906	0B01909A	Diode 1S1555
D907,908	0B06164A	LED LD271
L901	0B06588A	Coil 21mH
L902	0B06561A	Inductor 68μH
R901,903 906,907 911,913	0B01889A	Carbon Resistor 100K ERD-25T J
R902,904 905,908 909,910 912,914	0B05868A	Carbon Resistor 680K ERD-25T J
R915,916 923	0B05615A	Carbon Resistor 22K ERD-25T J
R917,918	0B01888A	Carbon Resistor 10K ERD-25T J
R919,920 921,922	0B05641A	Carbon Resistor 47K ERD-25T J
R924	0B01679A	Carbon Resistor 100 ERD-25T J
R925,926	0B05695A	Carbon Resistor 1 ERD-25T J
C901,902 903,904 905	0B05773A	Tantalum Capacitor 0.68μ 35V
C906	0B09290A	Ceramic Capacitor 0.01μ 50V J
C907,908	0B05790A	SP Capacitor 1200P 50V J
C909	0B05885A	Electrolytic Capacitor 100μ 10V
SW901,902 903,904 905,906	0B07219A	Switch AKC8S

14.2. Schematic Diagrams

14.2.1. Receiver

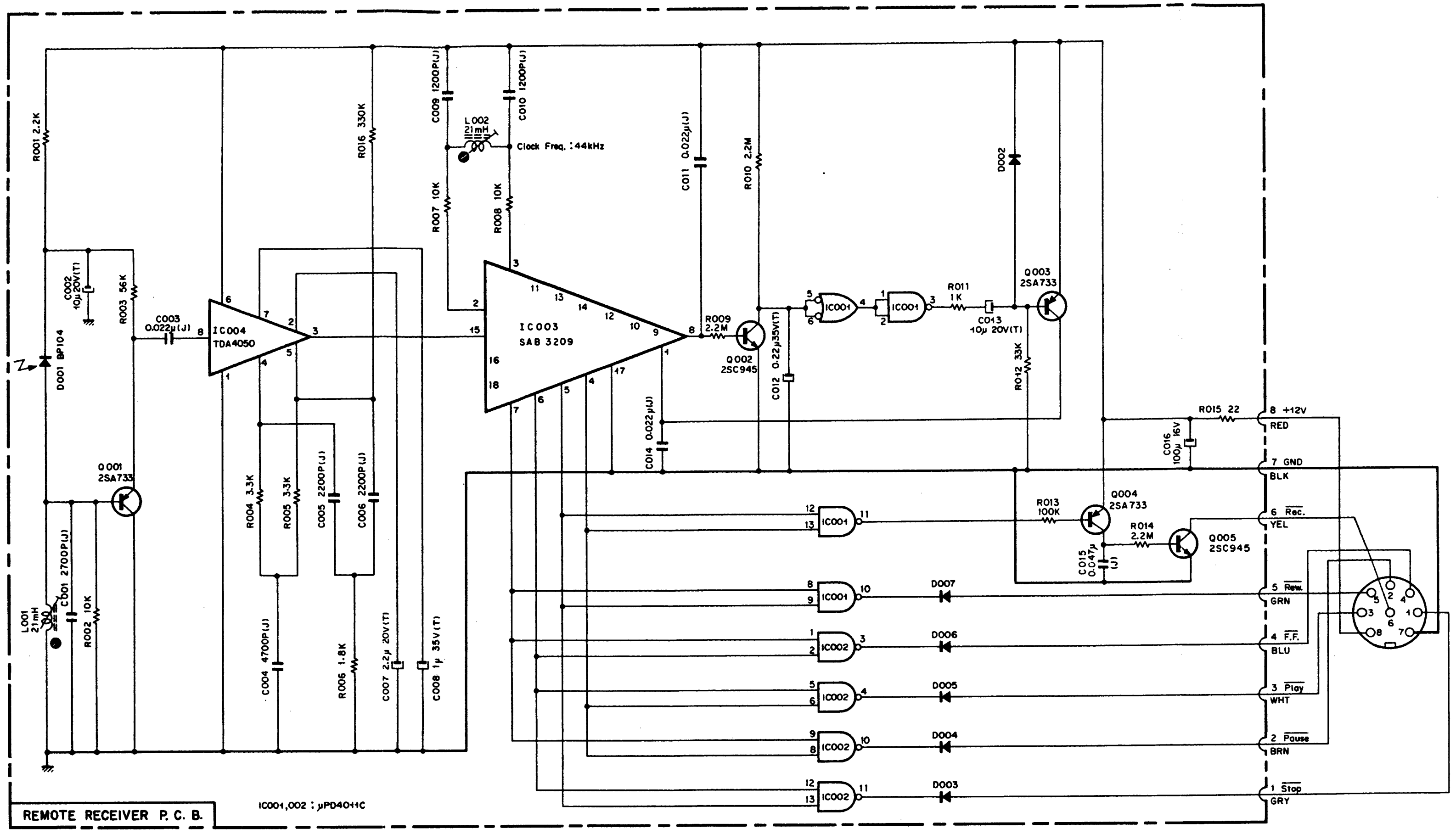

R001 2.2K
R016 330K
C009 1200P(J)
C010 1200P(J)
L002 21mH
Clock Freq. : 44kHz
C011 0.022μ(J)
R010 2.2M
D002
R007 10K
R008 10K
C002 10μ 20V(T)
R003 56K
C003 0.022μ(J)
IC004 TDA4050
IC003 SAB 3209
R009 2.2M
Q002 2SC945
C012 0.22μ 35V(T)
IC001
R011 1K
C013 10μ 20V(T)
Q003 2SA733
R012 33K
D001 BP104
Q001 2SA733
R004 3.3K
R005 3.3K
C005 2200P(J)
C006 2200P(J)
C014 0.022μ(J)
R015 22
C016 100μ 16V
8 +12V RED
7 GND BLK
R013 100K
Q004 2SA733
R014 2.2M
Q005 2SC945
C015 0.047μ (J)
6 Rec. YEL
5 Rew. GRN
4 F.F. BLU
3 Play WHT
2 Pause BRN
1 Stop GRY
D007
D006
D005
D004
D003
IC002
L001 21mH
C001 2700P(J)
R002 10K
C004 4700P(J)
R006 1.8K
C007 2.2μ 20V(T)
C008 1μ 35V(T)
REMOTE RECEIVER P. C. B.
IC001,002 : μPD4011C

Fig. 14.2.1

14.2.2. Transmitter

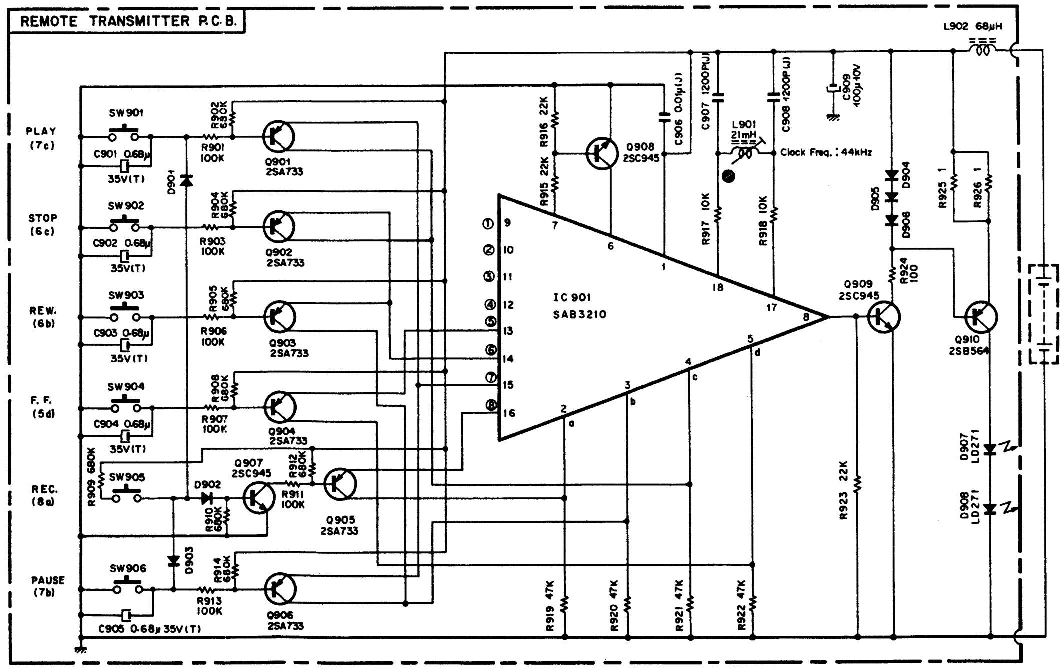

REMOTE TRANSMITTER P.C.B.
L902 68μH
PLAY (7c)
STOP (6c)
REW. (6b)
F. F. (5d)
REC. (8a)
PAUSE (7b)
SW901
SW902
SW903
SW904
SW905
SW906
C901 0.68μ 35V(T)
C902 0.68μ 35V(T)
C903 0.68μ 35V(T)
C904 0.68μ 35V(T)
C905 0.68μ 35V(T)
R901 100K
R903 100K
R906 100K
R907 100K
R911 100K
R913 100K
Q901 2SA733
Q902 2SA733
Q903 2SA733
Q904 2SA733
Q905 2SA733
Q906 2SA733
Q907 2SC945
D901
D902
D903
R909 680K
R910 680K
R912 680K
R914 680K
R916 22K
R915 22K
Q908 2SC945
C906 0.01μ(J)
C907 1200P(J)
C908 1200P(J)
C909 100μ 10V
L901 21mH
Clock Freq. : 44kHz
R917 10K
R918 10K
IC 901 SAB3210
Q909 2SC945
R924 100
D904
D905
D906
R925 1
R926 1
Q910 2SB564
9V
D907 LD271
D908 LD271
R923 22K
R919 47K
R920 47K
R921 47K
R922 47K

Fig. 14.2.2

14.3. Adjustments

14.3.1. Transmitter

(1) Disassemble the Bottom Case, then remove the Remote Transmitter P.C.B. Ass'y.

(2) Supply +9 V DC from an external Regulated Power Supply to the DC line of the Remote Transmitter P.C.B. Ass'y.

(3) Connect a Frequency Counter across the IC901-18 pin and ground.

(4) Push the Play Microswitch (SW901) to turn ON the power.

(5) Adjust Coil L901 to obtain 44 kHz ± 50 Hz on the Frequency Counter.

(6) Release the Play Microswitch (SW901), then remove the Regulated Power Supply and the Frequency Counter.

(7) Assemble the Remote Transmitter Ass'y.

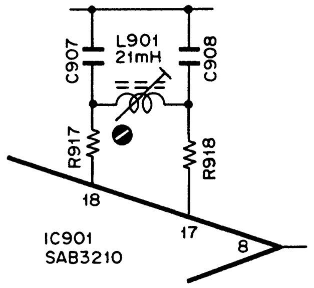


Fig. 14.3.1

14.3.2. Receiver

(1) Disassemble the Receiver Case, then remove the Remote Receiver P.C.B. Ass'y.

(2) Supply +12 V DC to the Remote Receiver P.C.B. Ass'y from an external Regulated Power Supply by connecting +12 V DC of the Regulated Power Supply to pin No.8 (RED) of the Remote Cord and ground to pin No. 7 (BLACK), or from the N-581 by plugging Remote Cord into Remote Control Socket of the N-581.

(3) Connect a Frequency Counter across the IC003 (SAB3209)-2 pin and ground.

(4) Adjust Coil L002 to obtain 44 kHz ± 50 Hz on the Frequency Counter.

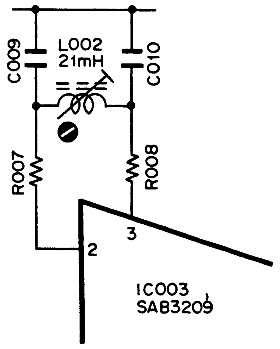


Fig. 14.3.2

(5) Insert a 1-MΩ resistor in series to the Oscillator output, then connect it across the base of Q001 and ground.

(6) Set the output of the Oscillator to the order of a few voltage, then calibrate the oscillator frequency to 22 kHz ± 25 Hz monitoring the frequency by the Frequency Counter.

(7) Connect an AC Voltmeter across the emitter of Q001 and ground.

(8) Adjust Coil L001 to obtain maximum reading on the AC Voltmeter.

(9) Remove the Oscillator, AC Voltmeter and Regulated Power Supply, then assemble the Remote Receiver Ass'y.

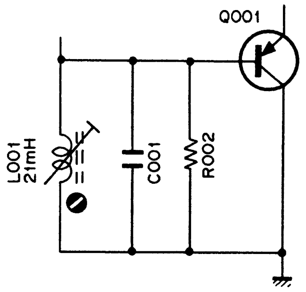


Fig. 14.3.3

14.3.3. Performance Check of Transmitter and Receiver

(1) Connect the Receiver to the Remote Control Socket of the N-581.

(2) Press each control switch of the Transmitter and check to insure whether every function operates accurately.

Note: Possible operating zone of the Transmitter is shown in Fig. 14.3.4.

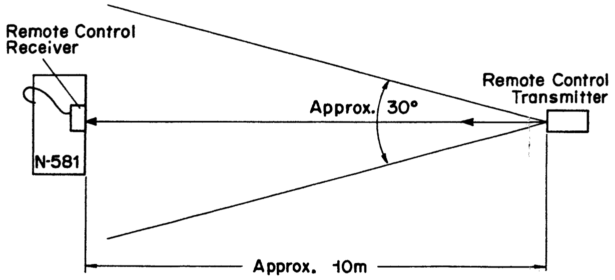


Fig. 14.3.4

14.4. Mechanism Ass'y and Parts List

14.4.1. Receiver

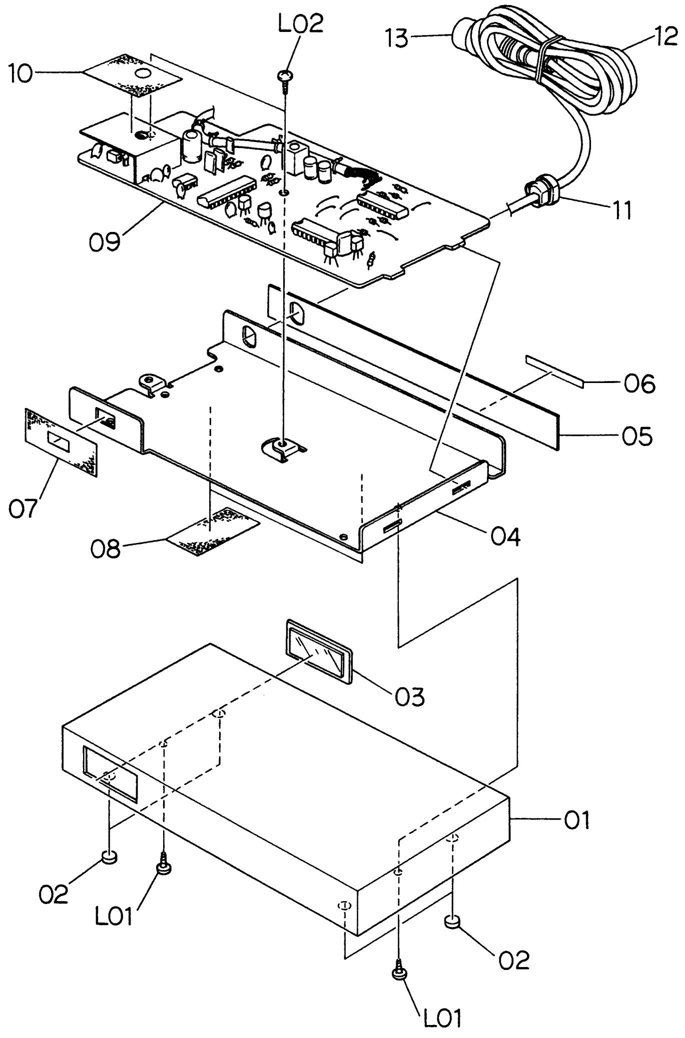


Fig. 14.4.1

Schematic Ref. No.	Part No.	Description	Q'ty
		Remote Receiver Ass'y	
01	0H03702B	Receiver Case	1
02	0A03285B	Leg RM 580	4
03	0H03649A	Acrylic Cover	1
04	0J03995B	Receiver Chassis	1
05	0M03975D	Rear Plate	1
06	0M03982A	Serial No. Seal (Receiver)	1
07	0J03996A	Chassis Mask	1
08	0J04008A	Chassis Himelon	2
09	BA04002A	Remote Receiver P.C.B. Ass'y	1
10	0J04007A	P.C.B. Himelon	1
11	0B08587A	Cord Bushing	1
12	0B05222B	8P Cord	1
13	0B08585A	8P DIN Plug	1
L01	0E00860A	BT Screw M3x6 Philips Binding Head (Bronze)	2
L02	0E00857A	BT Screw M3x6 Philips Binding Head	2

14.4.2. Transmitter

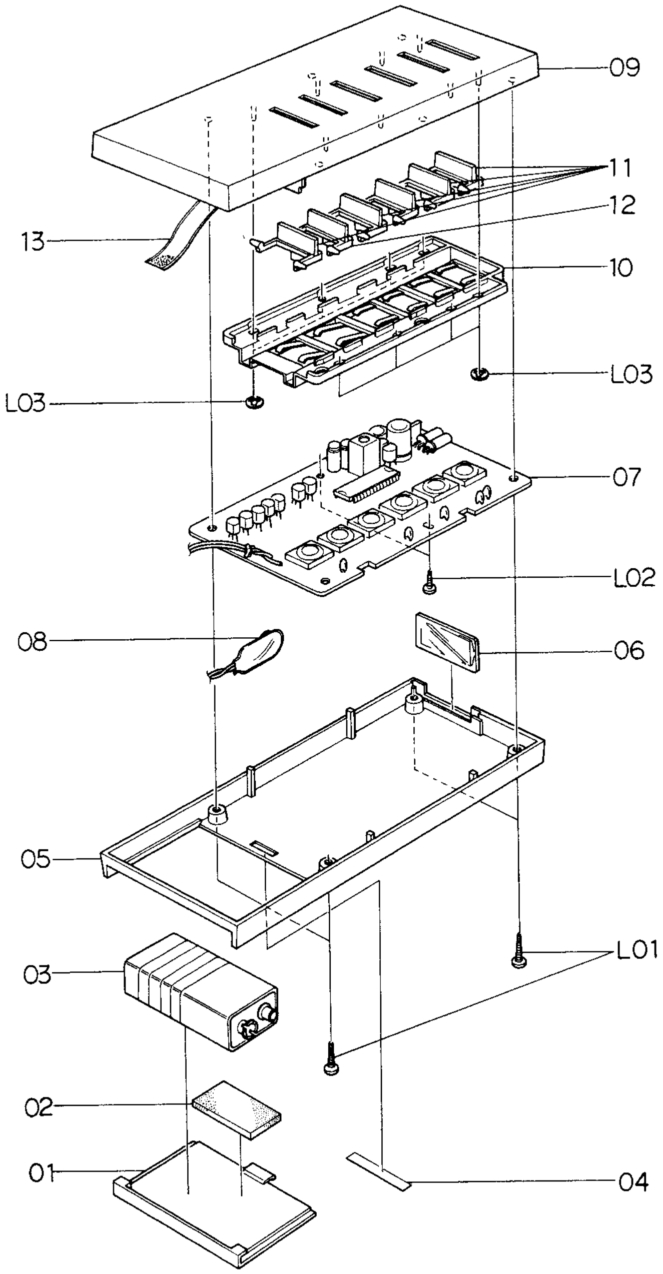


Fig. 14.4.2

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
		Remote Transmitter Ass'y		10	0J03994B	Spring Plate	1
				11	0H03659A	Control Button B	5
01	0H03705A	Battery Cover	1	12	0H03658A	Control Button A	1
02	0J03905A	Battery Cushion	1	13	0J03906A	Battery Ribbon	1
03	0B08529A	Battery 9V	1	L01	0E00825A	BT Screw M2.6x8 Philips Binding Head	4
04	0M03976A	Serial No. Seal (Transmitter)	1				
05	0H03704A	Bottom Case	1	L02	0E00824A	BT Screw M2.6x6 Philips Pan Head	2
06	0H03657A	Smoked Filter	1				
07	BA04004A	Remote Transmitter P.C.B. Ass'y	1	L03	0E00874A	Stopper Ring CS 2mm	3
08	0B05223B	Battery Snap B 110mm	1				
09	0H03701C	Top Case	1				

15. SPECIFICATIONS

Power Source	100, 120, 120/220-240, 220 or 240 V; 50/60 Hz
Power Consumption	27 W Max.
Tape Speed	1-7/8 ips. (4.8 cm/sec.) ±0.5%
Wow and Flutter	Less than 0.1% WTD Peak, 0.05% WTD rms
Frequency Response	20-20,000 Hz ±3 dB (–20 dB Rec. Level)
Signal to Noise Ratio	Better than 60 dB at 400 Hz, 0 dB, WTD rms
(Dolby NR In, 70μs)	Better than 66 dB at 400 Hz, 3% THD, WTD rms
Total Harmonic Distortion	Less than 0.8% at 400 Hz, 0 dB (ZX Tape)
	Less than 1.0% at 400 Hz, 0 dB (SX, EXII Tapes)
Erasure	Better than 60 dB below saturation level at 1 kHz
Separation	Better than 37 dB at 1 kHz, 0 dB
Crosstalk	Better than 60 dB at 1 kHz, 0 dB
Bias Frequency	105 kHz
Input	50 mV, 50 k ohms
Output Level	1 V (400 Hz, 0 dB, Output Level at Max.) 2.2 k ohms
Headphone	45 mW
DC Output Jack	±10V 125 mA Max.
Dimensions	500(W) x 130(H) x 350(D) m/m
	19-11/16(W) x 5-1/8(H) x 13-25/32(D) inches
Approximate Weight	8.3 kg, 18 lb, 5 oz

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